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DATE: Wednesday, March 02, 2005

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L9: Entry 2 of 27

File: USPT

Aug 3, 2004

US-PAT-NO: 6770449

DOCUMENT-IDENTIFIER: US 6770449 B2

TITLE: Methods of assaying receptor activity and constructs useful in such methods

DATE-ISSUED: August 3, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Barak; Lawrence S.	Durham	NC		
Caron; Marc G.	Hillsborough	NC		
Ferguson; Stephen S.	London			CA
Zhang; Jie	Durham	NC		

US-CL-CURRENT: [435/7.2](#); [435/325](#), [435/4](#), [435/7.1](#), [530/350](#)

CLAIMS:

What is claimed is:

1. A substrate having deposited thereon a plurality of cells, said cells expressing at least one GPCR and further comprising a biologically active labeled arrestin protein and wherein the label is capable of indicating localization of the arrestin and the GPCR is capable of binding the arrestin.

2. The substrate having deposited thereon a plurality of cells of claim 1, wherein the label is green fluorescent protein, .beta.-galactosidase, or luciferase.

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L9: Entry 4 of 27

File: USPT

May 4, 2004

US-PAT-NO: 6731781

DOCUMENT-IDENTIFIER: US 6731781 B1

TITLE: System and method for automatically processing microarrays

DATE-ISSUED: May 4, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Shams; Soheil	Redondo Beach	CA		
Park; James Darrell	Los Angeles	CA		
Zhou; Yi-Xiong	Los Angeles	CA		

US-CL-CURRENT: 382/129, 422/50, 422/51, 422/53, 422/73, 435/6, 435/7.2, 435/7.23,
702/19, 702/20, 702/27

CLAIMS:

What is claimed is:

1. A system for assessing chemical materials manifested as an array of signals, the array being a grid of a plurality of sub-grids of the chemical materials, said system comprising: a memory storing a digital image of the array; and a processor for accessing the digital image from said memory, identifying each of the plurality of sub-grids in the digital image, detecting in each of the plurality of sub-grids a center-representing pixel of a signal of a chemical material and an approximate radius of the signal, segmenting the signal, and calculating a characterizing measure for the segmented signal.

2. The system of claim 1 further comprising a scanner for scanning the array and outputting the digital image of the array into said memory.

3. The system of claim 1 further comprising an arrayer for depositing the chemical materials on a slide to form the array.

4. The system of claim 1, said processor detecting and measuring signals associated with the chemical materials in each sub-grid of the array.

5. The system of claim 1, said processor determining a level of confidence in the characterizing measure for the segmented signal.

6. The system of claim 1, the chemical materials being nucleic acid species and the array of signals being a microarray of signals associated with the nucleic acid species.

7. A method of assessing chemical materials manifested as an array of signals in a digital image, comprising the steps of: (a) identifying each of a plurality of sub-grids in the digital image; (b) detecting in each of the plurality of sub-grids a center-representing pixel of a signal of a chemical material and an approximate radius of the signal; (c) segmenting the signal; and (d) calculating a characterizing measure for the segmented signal.

8. The method of claim 7, the array of signals of the chemical materials being a microarray of expressed nucleic acid species, the method further comprising steps, prior to step (a), of: (a) depositing in a configuration of the microarray a plurality of nucleic acid species on a slide, (b) hybridizing to the microarray with multiple fluorescently labeled nucleic acids, and (c) generating a digital image of the microarray.

9. The method of claim 7 further comprising the step of determining a level of confidence in the characterizing measure for the segmented signal.

10. The method of claim 7, the chemical materials being nucleic acid species and the array of signals being a microarray of signals associated with the nucleic acid species.

11. A computer readable medium having stored therein one or more sequences of instructions for assessing chemical materials manifested as an array of signals in a digital image, said one or more sequences of instructions causing one or more processors to perform a plurality of acts, said acts comprising: (a) identifying each of the plurality of sub-grids in the digital image; (b) detecting in each of the plurality of sub-grids a center-representing pixel of a signal of a chemical material and an approximate radius of the signal; (c) segmenting the signal; and (d) calculating a characterizing measure for the segmented signal.

12. The computer readable medium of claim 11, said acts further comprising the step of determining a level of confidence in the characterizing measure for the segmented signal.

13. The computer readable medium of claim 11, the chemical materials being nucleic acid species and the array of signals being a microarray of signals associated with the nucleic acid species.

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☐ 1. Document ID: US 6833237 B1

L9: Entry 1 of 27

File: USPT

Dec 21, 2004

US-PAT-NO: 6833237

DOCUMENT-IDENTIFIER: US 6833237 B1

TITLE: Genes involved in stroke response and/or regulated by FK506, proteins encoded thereby, and methods of use

DATE-ISSUED: December 21, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Feinstein; Elena	Rehovot			IL
Mett; Igor	Rehovot			IL
Kachalsky; Sylvia G.	Rehovot			IL
Gorodin; Svetlana	Rishon-le-Zion			IL

US-CL-CURRENT: 435/4; 435/6, 435/7.1, 435/7.2, 514/44, 536/23.5

Full	Title	Citation	Front	Review	Classification	Date	Reference	Claims	KWC	Draw D
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☐ 2. Document ID: US 6770449 B2

L9: Entry 2 of 27

File: USPT

Aug 3, 2004

US-PAT-NO: 6770449

DOCUMENT-IDENTIFIER: US 6770449 B2

TITLE: Methods of assaying receptor activity and constructs useful in such methods

DATE-ISSUED: August 3, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Barak; Lawrence S.	Durham	NC		
Caron; Marc G.	Hillsborough	NC		
Ferguson; Stephen S.	London			CA

Zhang; Jie

Durham

NC

US-CL-CURRENT: 435/7.2; 435/325, 435/4, 435/7.1, 530/350

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWC	Draw D
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☐ 3. Document ID: US 6743967 B2

L9: Entry 3 of 27

File: USPT

Jun 1, 2004

US-PAT-NO: 6743967

DOCUMENT-IDENTIFIER: US 6743967 B2

**** See image for Certificate of Correction ****

TITLE: Artificial chromosomes, uses thereof and methods for preparing artificial chromosomes

DATE-ISSUED: June 1, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Hadlaczky; Gyula	Szamos			HU
Szalay; Aladar A.	Highland	CA		

US-CL-CURRENT: 800/25; 435/325, 435/455, 800/21

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWC	Draw D
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☐ 4. Document ID: US 6731781 B1

L9: Entry 4 of 27

File: USPT

May 4, 2004

US-PAT-NO: 6731781

DOCUMENT-IDENTIFIER: US 6731781 B1

TITLE: System and method for automatically processing microarrays

DATE-ISSUED: May 4, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Shams; Soheil	Redondo Beach	CA		
Park; James Darrell	Los Angeles	CA		
Zhou; Yi-Xiong	Los Angeles	CA		

US-CL-CURRENT: 382/129; 422/50, 422/51, 422/53, 422/73, 435/6, 435/7.2, 435/7.23, 702/19, 702/20, 702/27

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWC	Draw D
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☐ 5. Document ID: US 6709830 B2

L9: Entry 5 of 27

File: USPT

Mar 23, 2004

US-PAT-NO: 6709830

DOCUMENT-IDENTIFIER: US 6709830 B2

TITLE: Methods for modulating the activation of a lymphocyte expressed G protein coupled receptor involved in cell proliferation, autoimmunity and inflammation

DATE-ISSUED: March 23, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Witte; Owen N.	Sherman Oaks	CA		
Weng; Zhigang	Brookline	MA		
Le; Lu Q.	Los Angeles	CA		
Kabarowski; Janusz H. S.	Los Angeles	CA		
Xu; Yan	Pepper Pike	OH		
Zhu; Kui	Richmond Heights	OH		

US-CL-CURRENT: 435/7.1; 435/252.3, 435/325, 435/69.1, 435/7.2, 435/7.21, 536/23.1, 536/24.3

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWC	Draw D
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☐ 6. Document ID: US 6690470 B1

L9: Entry 6 of 27

File: USPT

Feb 10, 2004

US-PAT-NO: 6690470

DOCUMENT-IDENTIFIER: US 6690470 B1

TITLE: Automated laser capture microdissection

DATE-ISSUED: February 10, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Baer; Thomas M.	Mountain View	CA		
Hagen; Norbert	Livermore	CA		
Richardson; Bruce J.	Los Gatos	CA		
Brewer, III; David R.	Aptos	CA		
Reese; Lisa	Felton	CA		

US-CL-CURRENT: 356/417

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWC	Draw D
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☐ 7. Document ID: US 6531316 B1

L9: Entry 7 of 27

File: USPT

Mar 11, 2003

US-PAT-NO: 6531316

DOCUMENT-IDENTIFIER: US 6531316 B1

TITLE: Encryption of traits using split gene sequences and engineered genetic elements

DATE-ISSUED: March 11, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Patten; Phillip A.	Menlo Park	CA		
Lassner; Michael	Davis	CA		

US-CL-CURRENT: 435/455; 435/440, 435/463, 435/6, 435/91.1

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWIC	Draw D
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☐ 8. Document ID: US 6420124 B1

L9: Entry 8 of 27

File: USPT

Jul 16, 2002

US-PAT-NO: 6420124

DOCUMENT-IDENTIFIER: US 6420124 B1

TITLE: KVLQT1--a long qt syndrome gene

DATE-ISSUED: July 16, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Keating; Mark T.	Brookline	MA		
Sanguinetti; Michael C.	Salt Lake City	UT		
Curran; Mark E.	Newark	CA		
Landes; Gregory M.	Northboro	MA		
Connors; Timothy D.	Hopkinton	MA		
Burn; Timothy C.	Hockessin	DE		
Splawski; Igor	Allston	MA		

US-CL-CURRENT: 435/7.1; 435/7.2, 435/7.21, 436/507

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWIC	Draw D
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☐ 9. Document ID: US 6331405 B1

L9: Entry 9 of 27

File: USPT

Dec 18, 2001

US-PAT-NO: 6331405

DOCUMENT-IDENTIFIER: US 6331405 B1

TITLE: Receptor for Mycobacterium leprae and methods of use thereof

DATE-ISSUED: December 18, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Rambukkana; Anura	New York	NY		
Fischetti; Vincent A.	West Hempstead	NY		
Campbell; Kevin P.	Iowa City	IA		

US-CL-CURRENT: 435/7.2; 435/253.1, 435/29, 435/4, 435/7.1, 435/7.32, 435/7.8

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWIC	Draw D
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☐ 10. Document ID: US 6323177 B1

L9: Entry 10 of 27

File: USPT

Nov 27, 2001

US-PAT-NO: 6323177

DOCUMENT-IDENTIFIER: US 6323177 B1

TITLE: Interaction of reelin with very low density lipoprotein (VLDL) receptor for screening and therapies

DATE-ISSUED: November 27, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Curran; Thomas	Memphis	TN		
D'Arcangelo; Gabriella	Memphis	TN		

US-CL-CURRENT: 514/8; 435/325, 435/348, 435/7.1, 435/7.2, 530/350

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWIC	Draw D
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L9: Entry 13 of 27

File: USPT

Sep 11, 2001

US-PAT-NO: 6287790

DOCUMENT-IDENTIFIER: US 6287790 B1

TITLE: Utilization of nuclear structural proteins for targeted therapy and detection of proliferative and differentiation disorders

DATE-ISSUED: September 11, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Lelievre; Sophie	Berkeley	CA		
Bissell; Mina	Berkeley	CA		

US-CL-CURRENT: [435/7.23](#); [435/7.1](#), [435/7.2](#), [436/64](#)

CLAIMS:

We claim:

1. A method for distinguishing malignant and proliferating non-malignant cells, comprising:

- (a) supplying a sample of intact mammalian cells;
- (b) staining specifically Nuclear Mitotic Apparatus (NUMA) protein in said cells;
- (c) imaging said cells to determine the three dimensional pattern of labeled NUMA protein within nuclei of said cells; and
- (d) comparing the pattern of NUMA protein obtained in step (c) with known three dimensional pattern data from stained NUMA protein in malignant and proliferating non-malignant cells, whereby a lower degree of punctateness is correlated with malignancy.

2. The method of claim 1, wherein the imaging step is performed using a confocal microscope.

3. A method for distinguishing growth arrested, malignant and proliferating non-malignant cells, comprising:

- (a) supplying a sample of intact mammalian cells;
- (b) staining specifically Nuclear Mitotic Apparatus (NUMA) protein in said cells;
- (c) imaging said cells to determine the three dimensional pattern of labeled NUMA protein within the cells; and
- (d) comparing the pattern of NUMA protein obtained in step (c) with known three dimensional pattern data from stained NUMA protein in malignant and proliferating non-malignant cells, whereby a lower degree of punctateness is correlated with malignancy and growth arrested cells correlate with the highest degree of NUMA protein concentration.

4. The method of claim 3, wherein the imaging step is performed using a confocal microscope.

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L9: Entry 18 of 27

File: USPT

Oct 3, 2000

US-PAT-NO: 6127133

DOCUMENT-IDENTIFIER: US 6127133 A

TITLE: Automated analysis equipment and assay method for detecting cell surface protein function using same

DATE-ISSUED: October 3, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Akong; Michael Anthony	San Diego	CA		
Harpold; Michael Miller	San Diego	CA		
Velicelebi; Gonul	San Diego	CA		
Brust; Paul	San Diego	CA		

US-CL-CURRENT: [435/7.2](#); [422/68.1](#), [422/82.08](#), [435/69.1](#), [435/7.1](#), [436/43](#), [436/501](#), [436/79](#), [436/800](#)

CLAIMS:

What is claimed is:

1. An automated drug screening assay method for identifying compounds that modulate the activity of ion channels and/or receptors of a cell, comprising:

(a) introducing a divided culture vessel that has an array of individual compartments into an automated assay apparatus, wherein:

the apparatus delivers reagent solution to one or more of the compartments and has detection means to measure transient changes in an optical attribute in the compartments;

at least two of the compartments contain viable cells that comprise either or both the ion channel and receptor;

at least one, and up to one fewer than all of the cell-

containing compartments also comprises one or more test compound(s) that is (are) being screened for the ability to modulate the activity of the ion channel or receptor;

the ion channel or receptor, when activated, directly or indirectly contributes to a detectable change in the cytoplasmic level of a predetermined ion in the cells; and

the cytoplasm of the cells contains an amount of an ion-sensitive fluorescent indicator sufficient to detect a change in the concentration of the predetermined ion;

(b) automatically delivering to a cell-containing compartment, an aliquot of a solution comprising an amount of a known ion channel- or receptor-activating compound that activates the ion channel or receptor, whereby, the change in concentration of the predetermined ion commences;

(c) within a time period before any induced ion concentration change would be at a maximum, automatically detecting and measuring for a predetermined amount of time in the cell-containing compartment to which an aliquot of solution has been added ion flux by measuring fluorescence emitted by the ion-sensitive indicator in response to an excitation wavelength, whereby compounds that modulate the activity of ion channels and/or receptors of a cell are identified.

2. An automated drug screening assay of claim 1, wherein the ion channels or receptors are capable of fluxing said ion and the cells are bathed in a solution comprising a concentration of said ions which is sufficient to cause a detectable increase in the level of said ions in the cytoplasm when said ion channels or receptors are activated.

3. An automated drug screening assay according to claim 2 wherein said cells comprise voltage-dependent calcium channels and the solution bathing the cells comprises a concentration of calcium ions which is sufficient to

cause a detectable increase in the level of calcium ions in the cytoplasm when the calcium channels are activated by membrane depolarization.

4. An automated drug screening assay according to claim 3 wherein said cells are recombinant cells which express heterologous calcium channels.

5. An automated drug screening assay according to claim 4 wherein said recombinant cells are transfected human embryonic kidney cells.

6. An automated drug screening assay according to claim 2 wherein said cells have ligand-gated ion channels.

7. An automated drug screening assay of claim 3, wherein:

the cells have both voltage-dependent calcium channels and ligand-gated ion channels, and

the known receptor-activating compound is a ligand capable of activating the ligand-gated ion channel and depolarizing the cell membranes whereby the voltage-dependent calcium channels open.

8. An automated drug screening assay of claim 7, wherein the test compound is screened for its ability to inhibit activation of the ligand-gated ion channels.

9. An automated drug screening assay of claim 1, wherein the cells comprise a G-protein-coupled receptor and the known receptor-activating compound is a ligand capable of activating the receptor so as to cause an increase in the level of cytoplasmic calcium ions.

10. An automated drug screening assay of claim 9, wherein the G-protein-coupled receptors is selected from the group consisting of metabotropic EAA receptors and muscarinic acetylcholine receptors.

11. The assay of claim 6, wherein the cells comprise ligand-gated ion channels comprising a nicotinic acetylcholine receptor, kainate/AMPA receptor, or a

nicotinic acetylcholine receptor and a kainate/AMPA receptor.

12. The method of claim 1, further comprising, after step (c) comparing the intensity of fluorescence in a cell-containing compartment comprising the test compound with the intensity of fluorescence produced by a substantially identical cell-containing compartment treated substantially identically except in that it does not contain the test compound.

13. The method of claim 1, wherein steps (b) and (c), are repeated until all of the cell-containing compartments have been measured.

14. The method of claim 12, wherein steps (b) and (c) are repeated until all of the cell-containing compartments have been measured.

15. The method of claim 1, further comprising (d) repeating steps (b) and (c) successively for one or more of the remaining cell-containing compartments.

16. The method of claim 1, wherein the time period between steps (b) and (c) is less than or equal to about 30 seconds.

17. An automated drug screening assay of claim 3, wherein the cells are Ltk.sup.- cells, COS-7 cells, DG44 cells, or Chinese hamster ovary (CHO) cells.

18. The method of claim 1, wherein the test compound activates the ion channel or receptor.

19. The method of claim 1, wherein the test compound antagonizes the activity of the ion channel or receptor.

20. The method of claim 1, wherein the test compound potentiates the activity of the ion channel or receptor.

21. An automated drug screening assay method for identifying compounds that modulate the activity of ion channels and/or receptors of a cell, comprising:

(a) introducing a divided culture vessel that has an array of individual compartments into an automated assay apparatus, wherein:

the apparatus delivers reagent solution to one or more of the compartments and has detection means to measure transient changes in an optical attribute in the compartments;

at least two of the compartments contain viable cells, wherein the cells comprise the ion channel or receptor;

the ion channel or receptor, when activated, directly or indirectly contributes to a detectable change in the cytoplasmic level of a predetermined ion in the cells; and

the cytoplasm of the cells contain an amount of an ion-sensitive fluorescent indicator sufficient to detect a change in the concentration of the predetermined ion;

(b) automatically delivering to a cell-containing compartment, an aliquot of a solution comprising a test compound being tested for ability to alter the activity of the ion channel or receptor, whereby, if the test compound activates the ion channel or receptor, a change in the concentration of the predetermined ion commences;

(c) within a time period before any concentration change of the predetermined ion would be at its maximum, automatically detecting and measuring in one or more of the cell-containing compartment to which the aliquot of solution has been added, for a predetermined amount of time, ion flux by measuring the fluorescence emitted by the ion-sensitive indicator in response to an excitation wavelength, whereby compounds that modulate the activity of ion channels and/or receptors of a cell are identified.

22. An automated drug screening assay of claim 21, wherein the ion channels or receptors are capable of fluxing said ion and the cells are bathed in a solution

comprising a concentration of said ions which is sufficient to cause a detectable increase in the level of said ions in the cytoplasm when said ion channels or receptors are activated.

23. An automated drug screening assay according to claim 22 wherein said cells comprise voltage-dependent calcium channels and the solution bathing the cells comprises a concentration of calcium ions which is sufficient to cause a detectable increase in the level of calcium ions in the cytoplasm when the calcium channels are activated by membrane depolarization.

24. An automated drug screening assay according to claim 23 wherein said cells are recombinant cells which express heterologous calcium channels.

25. An automated drug screening assay according to claim 24 wherein said recombinant cells are transfected human embryonic kidney cells.

26. An automated drug screening assay according to claim 22 wherein said cells have ligand-gated ion channels.

27. An automated drug screening assay of claim 23, wherein said cells have both voltage-dependent calcium channels and ligand-gated ion channels, and wherein, activation of the ligand-gated ion channel depolarizes the cell membrane so as to open the voltage-dependent calcium channels.

28. An automated drug screening assay of claim 21, further comprising in step (b) adding a known activator of the ion channel or receptor simultaneously with or before addition of the test compound, wherein the test compound is being screened for its ability to inhibit activation of the ion channel or receptor.

29. An automated drug screening assay of claim 21, wherein: the cells comprise a G-protein-coupled receptor; and activation of the receptor causes an increase in the level of an ion in the cytoplasm.

30. An automated drug screening assay according to claim 29 wherein the cells comprise receptors selected from the group consisting of metabotropic EAA receptors and muscarinic acetylcholine receptors.

31. A method according to claim 27 wherein the cells comprise a receptor selected from the group consisting of nicotinic acetylcholine receptors and kainate/AMPA receptors.

32. The method of claim 21, further comprising repeating steps (b) and (c) successively for one or more of the remaining cell-containing compartments.

33. The method of claim 21, further comprising:

(d) comparing the intensity of fluorescence in the cell-containing compartments that received the test compound with the intensity of fluorescence produced by one or more of cell-containing compartments that received a solution that is devoid of any compound that activates the ion channels or receptors.

34. The method of claim 21, wherein steps (b) and (c) are repeated until all of cell-containing compartments have been measured.

35. The method of claim 33, wherein steps (b) and (c) are repeated until all of cell-containing compartments have been measured.

36. The method of claim 21, further comprising, after step (d) comparing

the intensity of fluorescence in a cell-containing compartment that received the test compound with the intensity of fluorescence produced by a substantially identical cell-containing compartment treated substantially identically except that the cells do not comprise the receptor or ion channel.

37. The method of claim 21, wherein the time period between steps (b) and (c) is less than or equal to about 30 seconds.

38. An automated drug screening assay of claim 22, wherein the cells are Ltk.sup.- cells, COS-7 cells, DG44 cells, or Chinese hamster ovary (CHO) cells.

39. The method of claim 21, wherein the test compound activates the ion channel or receptor.

40. The method of claim 21, wherein the test compound antagonizes the activity of the ion channel or receptor.

41. The method of claim 21, wherein the test compound potentiates the activity of the ion channel or receptor.

42. The method of claim 21, wherein prior to adding the test compound, an agonist of the ion channel or receptor is added to one or more cell-containing compartments.

43. The method of claim 40, wherein prior to adding the test compound, an agonist of the ion channel or receptor is added to one or more cell-containing compartments.

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File: USPT

May 2, 2000

US-PAT-NO: 6057114

DOCUMENT-IDENTIFIER: US 6057114 A

TITLE: Automated assays and methods for detecting and modulating cell surface protein function

DATE-ISSUED: May 2, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Akong; Michael Anthony	San Diego	CA		
Harpold; Michael Miller	El Cajon	CA		
Velicelebi; Gonul	San Diego	CA		
Brust; Paul	San Diego	CA		

US-CL-CURRENT: 435/7.21; 422/50, 422/55, 422/62, 422/67, 422/68.1, 422/82.03, 422/82.07, 422/82.08, 435/40.5, 435/40.51 , 435/40.52, 435/7.2, 436/43, 436/519, 436/800, 436/807, 436/809

CLAIMS:

What is claimed is:

1. An automated method for detecting or measuring the activity of ion channels and/or receptors of a cell, comprising:

(a) introducing a divided culture vessel having an array of individual compartments into an apparatus, wherein:

at least two compartments contain cells to be assayed for the activity of ion channels and/or receptors;

the ion channels and/or receptors when activated, directly or indirectly, cause a change in the concentration of a predetermined ion in the cytoplasm of the cells;

the cytoplasm of the cells comprise an amount of an ion-sensitive fluorescent indicator sufficient to detect a

change in the concentration of the predetermined ion;
and

the apparatus delivers reagent solution to one or more compartments of the divided culture vessel and detects or measures an attribute of the contents of each compartment;

(b) automatically delivering to one or more of the compartments an amount of a known ion channel- or receptor-activating compound that is effective to activate the ion channel or receptor;

(c) within a predetermined time that is less than the time for any induced change in ion concentration to reach a maximum, automatically detecting and measuring, in one or more of the individual compartments for a predetermined amount of time, a change in ion concentration by measuring fluorescence emitted by the ion-sensitive indicator in response to an excitation wavelength, whereby the activity of ion channels and/or receptors of a cell is detected or measured.

2. The method of claim 1 wherein at least two of the individual compartments contain cells being assayed for the presence of ion channels and/or receptors, and steps (b) and (c) are repeated at least once.

3. The method of claim 1 further comprising (d) repeating steps (b) and (c) in turn for each of the remaining compartments that contain cells until all the individual compartments containing the cells have been assayed.

4. The method of claim 1, wherein the compound is added to more than one compartment at a time.

5. The method of claim 4, wherein detecting and measuring of fluorescence is effected in more than one compartment at a time.

6. The method of claim 1, wherein during measurement, the compartment on which measurement is effected is

sufficiently aligned with measuring and detecting means in the apparatus to permit measurement or detection.

7. The method of claim 6, wherein measurement is effected on more than one compartment at a time and more than one compartment is sufficiently aligned with measuring and detecting means in the apparatus to permit measurement or detection.

8. The method of claim 1, wherein measurement is effected in more than one compartment at a time using a charge coupled device (CCD) or a photodiode array in response to computer control.

9. An automated drug screening assay for identifying compounds that modulate activity of ion channels and/or receptors of a cell, comprising

(a) introducing a divided culture vessel having an array of individual compartments into an apparatus, wherein:

at least two compartments contain cells to be assayed comprising ion channels and/or receptors that when activated, directly or indirectly, cause a detectable change in the concentration of a predetermined ion in the cytoplasm of the cells;

the cytoplasm of the cells comprises an amount of an ion-sensitive fluorescent indicator sufficient to detect a change in the concentration of the predetermined ion; and

the apparatus delivers reagent solution to one or more compartments of the divided culture vessel and detects and measures an attribute of the contents of the individual compartments;

(b) automatically delivering to one or more predetermined compartments an aliquot of a solution comprising either or both of (i) an amount of a known ion channel- or receptor-activating compound that is effective to activate the ion channel or receptor, and (ii) a test compound of unknown ion channel or receptor

activity; and

(c) within a predetermined time that is less than an amount of time for any induced ion flux to reach a maximum, detecting and measuring, in one or more of the individual compartments for a predetermined amount of time, the induced ion flux by detecting or measuring fluorescence emitted by the ion-sensitive indicator in response to an excitation wavelength, whereby compounds that modulate activity of ion channels and/or receptors of a cell are identified.

10. The assay of claim 9, wherein at least two of the individual compartments contain cells to be delivered a compound and steps (b) and (c) are repeated at least once.

11. The assay of claim 9, further comprising (d) repeating steps (b) and (c) in turn for each compartment containing cells until all the compartments containing the cells have been assayed.

12. The assay of claim 11, wherein:

a compound is tested for its ability to activate ion channels or receptors;

the aliquot delivered comprises an amount of the test compound; and wherein,

after step (d), fluorescence intensity is determined in each of the compartments containing the cells to which the test compound is added, relative to the fluorescence intensity produced by at least one compartment containing substantially identical cells that does not receive the known activating compound or test compound.

13. The assay of claim 9, wherein at least one of the compartments containing the cells also contains the test compound and the known activator of the receptor or ion channel is delivered by the apparatus.

14. The assay of claim 13, wherein the cells have voltage-dependent calcium channels and ligand-gated ion

channels and the test compound inhibits activation of the ligand-gated ion channels.

15. The assay of claim 9, wherein in step (b) the known activator of the receptor or ion channel is delivered by the apparatus along with the test compound to at least one of the compartments containing the cells.

16. The assay of claim 9, wherein in step (b) a test compound and a known activator of the receptor or ion channel are delivered successively to at least one of the compartments containing the cells.

17. The assay of claim 9, wherein in step (b) only the test compound is delivered by the apparatus to at least one of the compartments containing the cells.

18. The assay of claim 9, wherein:

a compound is tested for its ability to inhibit or potentiate ion channels or receptors; and

wherein: (i) at least a portion of the compartments containing the cells further comprise the test compound; (ii) each of the aliquots delivered comprise an effective amount of a known activating compound; and (iii) after step (d), the intensity of fluorescence in each of the individual compartments containing the cells comprising the test compound is determined, relative to the intensity of fluorescence in at least one compartment containing the cells and treated substantially identically, except in the absence of the test compound.

19. The assay of claim 9, wherein the ion channels or receptors flux the ion when activated and the cells are bathed in a solution comprising a concentration of the ions which is sufficient to cause a detectable increase in the level of the ions in the cytoplasm when the ion channels or receptors are activated.

20. The assay of claim 19, wherein the cells comprise voltage-dependent calcium channels and the solution

bathing the cells comprises a concentration of calcium ions which is sufficient to cause a detectable increase in the level of calcium ions in the cytoplasm of the cells when the calcium channels are activated by membrane depolarization.

21. The assay of claim 20, wherein the solution delivered in step (b)(i) comprises a membrane-depolarizing amount of potassium ions.

22. The assay of claim 19, wherein the cells have ligand-gated ion channels.

23. The assay of claim 22, wherein the ligand-gated ion channel is selected from the group consisting of nicotinic acetylcholine receptors and kainate/.alpha.-amino-3-hydroxy-5-methyl-isoxazole-4-propionic acid (AMPA) receptors.

24. The assay of claim 9, wherein:

at least one of the compartments contains non-expressing cells that do not express the cell surface receptor or ion channel but to which test compound has been added or that contain said non-expressing cells to which the test compound has not been added; and

the intensity of fluorescence in each of the compartments containing the cells comprising a test compound is determined, relative to the intensity of fluorescence in at least one compartment that is treated substantially identically but that contains said non-expressing cells to which test compound has been added or said non-expressing cells to which test compound has not been added.

25. The assay of claim 9, wherein the cells are recombinant cells that express heterologous calcium channels.

26. The assay of claim 25, wherein the recombinant cells are transfected human embryonic kidney cells.

27. The assay of claim 9, wherein the cells have

voltage-dependent calcium channels and ligand-gated ion channels, wherein the solution delivered in step (b) comprises an amount of a known activator of the ligand-gated ion channel or a test compound, and wherein activation of the ligand-gated ion channel depolarizes the cell membrane, whereby voltage-dependent calcium channels open.

28. The assay of claim 9, wherein the cells have voltage-dependent calcium channels and ligand-gated ion channels, wherein the solution delivered in step (b) comprises an amount of a known activator of the ligand-gated ion channel and a test compound and the test compound inhibits activation of the ligand-gated ion channels.

29. The assay of claim 9, wherein:

the cells comprise a G-protein-coupled receptor; the solution delivered in step (b) comprises a known activator of the G-protein-coupled receptor or a test compound; and

activation of the receptor causes an increase in the level of cytoplasmic calcium ions.

30. The assay of claim 29, wherein the G-protein-coupled receptor is selected from the group consisting of metabotropic excitatory amino acid (EAA) receptors and muscarinic acetylcholine receptors.

31. The assay of claim 9, wherein the fluorescent indicator is 9-(4-bis(carboxymethyl)amino-3-(2-(2-bis-(carboxymethyl)amino-5-methylphenoxy)ethoxy)phenyl)-2,7-dichloro-6-hydroxy-3 H-xanthen-3-one (fluo-3).

32. The automated drug screening assay of claim 9, wherein in step (b) solution is delivered to one predetermined compartment followed by detection and measurement for a predetermined amount of time of fluorescence in that compartment.

33. The assay of claim 32, wherein steps (b) and (c) are

repeated in turn in all of the compartments containing the cells.

34. The assay of claim 9, wherein the compound is added to more than one compartment at a time.

35. The assay of claim 34, wherein detecting and measuring of fluorescence is effected in more than one compartment at a time.

36. The assay of claim 9, wherein during measurement, the compartment on which measurement is effected is sufficiently aligned with measuring and detecting means in the apparatus to permit measurement or detection.

37. The assay of claim 36, wherein measurement is effected on more than one compartment at a time and more than one compartment is sufficiently aligned with measuring and detecting means in the apparatus to permit measurement or detection.

38. The method of claim 9, wherein measurement is effected in more than one compartment at a time using a charge coupled device (CCD) or a photodiode array in response to computer control.

39. An automated method for detecting or measuring an occurrence of a cellular event that directly or indirectly induces a change in intensity of an optical attribute of an indicator moiety in response to the cellular event, comprising:

(a) introducing a divided culture vessel having an array of individual compartments into an apparatus, wherein:

at least one compartment contains cells that, when contacted with a compound that causes the cellular event to occur, undergo the cellular event;

the cytoplasm of the cells comprises an amount of the indicator moiety sufficient to exhibit a detectable change in the intensity of the optical attribute upon occurrence of the event; and

the apparatus has delivery means to deliver reagent solution to one or more compartments of the divided culture vessel and means to detect and measure at least one optical attribute of the contents of the compartments;

(b) automatically delivering to one or more predetermined compartments, an aliquot of a solution comprising an amount of a compound that causes the cellular event to occur thereby allowing a detectable increase in the intensity of the optical attribute in the compartment containing the cells to be measured, wherein the delivery means and predetermined compartments are aligned; and

(c) within a predetermined time period that is less than the time for the cellular event indicated by the change in the intensity of the optical attribute to reach its peak, detecting and measuring in one or more of the predetermined compartments for a predetermined amount of time the intensity of the optical attribute emitted by the cells, wherein the detecting and measuring means and predetermined compartments are aligned, and whereby the occurrence of a cellular event is detected or measured.

40. The method of claim 39, wherein:

the cells express amino acid transporter function;

the cellular event is amino acid transport; and

the indicator moiety is an amino acid-fluorescent indicator conjugate.

41. The method of claim 39, wherein the cellular event is a change in an intracellular concentration of one or more cyclic nucleotides.

42. The method of claim 39, wherein the compound is added to more than one compartment at a time.

43. The method of claim 42, wherein detecting and measuring of the optical attribute is effected in more

than one compartment at a time.

44. The method of claim 39; wherein during measurement, the compartment on which measurement is effected is sufficiently aligned with measuring and detecting means in the apparatus to permit measurement or detection.

45. The method of claim 44, wherein measurement is effected on more than one compartment at a time and more than one compartment is sufficiently aligned with measuring and detecting means in the apparatus to permit measurement or detection.

46. The method of claim 39, wherein the cellular event is cell injury or cell death and the indicator moiety is a pH sensitive fluorescent indicator.

47. The method of claim 39, wherein the cellular event is modulation of the activity of an ion-channel or receptor and the indicator moiety is a ion-sensitive indicator.

48. The method of claim 39, wherein the cellular event is a change in the concentration of one or more cyclic nucleotides and the indicator moiety is cyclic AMP-dependent-protein kinase indicator conjugate.

49. An automated method for identifying compounds that induce the occurrence of a cellular event that results in a change in the intensity of an optical attribute of an indicator moiety in response to the cellular event, the method comprising:

(a) introducing a divided culture vessel having an array of individual compartments into an apparatus, wherein:

(i) at least one compartment contains cells that when contacted with a compound that causes the cellular event to occur, undergo the cellular event;

(ii) the cytoplasm of the cells comprises an amount of an indicator moiety sufficient to exhibit a detectable change in the intensity of the optical attribute upon occurrence of the event; and

(iii) the apparatus has delivery means to deliver reagent solution to one or more compartments of the divided culture vessel, and detecting and measuring means to detect and measure at least one attribute of the contents of the compartments;

(b) automatically delivering to one or more predetermined compartments an aliquot of a solution comprising either or both of (i) an amount of a known compound that is effective to induce the cellular event; and (ii) a test compound of unknown activity; and

(c) within a predetermined time period that is less than the time for the cellular event indicated by the change in the intensity of the optical attribute to reach a maximum, detecting and measuring in one or more of the predetermined compartments, for a predetermined amount of time the level of the optical attribute emitted by the cells, wherein the detecting and measuring means and the predetermined compartments are aligned, whereby a compound that induces the occurrence of a cellular event is identified.

50. The method of claim 49, wherein the compound is added to more than one compartment at a time.

51. The method of claim 50, wherein detecting and measuring of the optical attribute is effected in more than one compartment at a time.

52. The method of claim 49, wherein during measurement, the compartment on which measurement is effected is sufficiently aligned with measuring and detecting means in the apparatus to permit measurement or detection.

53. The method of claim 49, wherein measurement is effected on more than one compartment at a time and more than one compartment is sufficiently aligned with measuring and detecting means in the apparatus to permit measurement or detection.

54. The method of claim 53, wherein measurement is

effected in more than one compartment at a time using a charge coupled device (CCD) or a photodiode array in response to computer control.

55. The method of claim 49, wherein measurement is effected in more than one compartment at a time using a charge coupled device (CCD) or a photodiode array in response to computer control.

56. The method of claim 49, wherein the test compound and unknown compound are added simultaneously.

57. The method of claim 49, wherein the test compound and unknown compound are added serially.

58. A method for automatically measuring an optical attribute indicative of occurrence of a transient reaction in a computer-controlled measurement apparatus, the method comprising:

(a) introducing an ion-sensitive indicator into cells in a plurality of

wells of a multi-well plate containing samples to be measured;

(b) identifying at least one predetermined well of a plurality of wells of a multi-well plate containing samples to be measured;

(c) aligning the predetermined well(s) by the apparatus with a predetermined position;

(d) adding reagent by the apparatus to the predetermined well(s) at the predetermined position(s), wherein the reagent induces directly or indirectly the transient reaction;

(e) measuring the optical attribute of the predetermined well(s) while aligned with the position(s), wherein commencement of measurement occurs within a predetermined time period that is less than the time required for the reaction to reach its peak response and measurement is effected for a predetermined amount of

time, whereby the optical attribute indicative of a transient reaction is automatically measured in the computer-controlled apparatus.

59. The method of claim 58, wherein the reagent is added to more than one compartment at a time.

60. The method of claim 59, wherein measuring is effected in more than one compartment at a time.

61. The method of claim 58, wherein during measurement, the compartment on which measurement is effected is sufficiently aligned with measuring and detecting means in the apparatus to permit measurement or detection.

62. The method of claim 61, wherein measurement is effected on more than one compartment at a time and more than one compartment is sufficiently aligned with measuring and detecting means in the apparatus to permit measurement or detection.

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L9: Entry 23 of 27

File: USPT

Nov 17, 1998

US-PAT-NO: 5837478

DOCUMENT-IDENTIFIER: US 5837478 A

**** See image for Certificate of Correction ****

TITLE: Method of identifying modulators of binding between and VCAM-1

DATE-ISSUED: November 17, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Gallatin; W. Michael	Mercer Island	WA		
Van der Vieren; Monica	Seattle	WA		

US-CL-CURRENT: 435/7.24; 435/7.1, 435/7.2, 435/7.21, 435/7.8

CLAIMS:

What is claimed is:

1. A method for identifying a modulator of binding between .alpha..sub.d and VCAM-1 comprising the steps of:

a) contacting .alpha..sub.d and VCAM-1 in the presence and absence of a putative modulator compound;

b) detecting binding between .alpha..sub.d and VCAM-1; and

c) identifying a putative modulator compound in view of decreased or increased binding between .alpha..sub.d and VCAM-1 in the presence of the putative modulator as compared to binding in the absence of the putative modulator.

2. The method according to claim 1 which is carried out in a host cell containing a soluble .alpha..sub.d and a soluble VCAM-1 and wherein decreased or increased binding is quantitated through measurement of a binding-dependent phenotypic change in the host cell, said

phenotypic change resulting from a change in expression or a reporter gene product.

3. A method for identifying a compound that modulates binding between .alpha..sub.d and VCAM-1 comprising the steps of:

- a) immobilizing .alpha..sub.d or a fragment thereof, or VCAM-1 or a fragment thereof, on a solid support;
- b) labelling the non-immobilized binding partner with a detectable agent;
- c) contacting said immobilized binding partner with said labelled binding partner in the presence and absence of a putative modulator compound capable of specifically reacting with .alpha..sub.d or VCAM-1;
- d) detecting binding between said immobilized binding partner and said labelled binding partner; and
- e) identifying modulating compounds as those compounds that affect binding between said immobilized binding partner and said labelled binding partner.

4. The method of claim 3 wherein .alpha..sub.d or VCAM-1 is immobilized on a solid support coated or impregnated with a fluorescent agent; said non-immobilized binding partner is labelled with a compound capable of exciting said fluorescent agent; and .alpha..sub.d interaction with the binding partner of .alpha..sub.d is detected by light emission from said fluorescent agent.

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☐ 21. Document ID: US 6025155 A

L9: Entry 21 of 27

File: USPT

Feb 15, 2000

US-PAT-NO: 6025155

DOCUMENT-IDENTIFIER: US 6025155 A

TITLE: Artificial chromosomes, uses thereof and methods for preparing artificial chromosomes

DATE-ISSUED: February 15, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Hadlaczky; Gyula	Szamos			HU
Szalay; Aladar A.	Highland	CA		

US-CL-CURRENT: [435/69.1](#); [435/320.1](#), [435/325](#), [435/455](#), [435/6](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWIC	Draw D
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☐ 22. Document ID: US 5891646 A

L9: Entry 22 of 27

File: USPT

Apr 6, 1999

US-PAT-NO: 5891646

DOCUMENT-IDENTIFIER: US 5891646 A

TITLE: Methods of assaying receptor activity and constructs useful in such methods

DATE-ISSUED: April 6, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Barak; Lawrence S.	Durham	NC		
Caron; Marc G.	Hillsborough	NC		
Ferguson; Stephen S.	London			CA
Zhang; Jie	Durham	NC		

US-CL-CURRENT: [435/7.2](#); [435/69.1](#), [435/7.1](#), [530/350](#), [536/23.4](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KMC	Draw D
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☐ 23. Document ID: US 5837478 A

L9: Entry 23 of 27

File: USPT

Nov 17, 1998

US-PAT-NO: 5837478

DOCUMENT-IDENTIFIER: US 5837478 A

**** See image for Certificate of Correction ****

TITLE: Method of identifying modulators of binding between and VCAM-1

DATE-ISSUED: November 17, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Gallatin; W. Michael	Mercer Island	WA		
Van der Vieren; Monica	Seattle	WA		

US-CL-CURRENT: 435/7.24; 435/7.1, 435/7.2, 435/7.21, 435/7.8

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KMC	Draw D
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☐ 24. Document ID: US 5766850 A

L9: Entry 24 of 27

File: USPT

Jun 16, 1998

US-PAT-NO: 5766850

DOCUMENT-IDENTIFIER: US 5766850 A

**** See image for Certificate of Correction ****

TITLE: Human .beta.2 integrin .alpha. subunit

DATE-ISSUED: June 16, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Gallatin; W. Michael	Seattle	WA		
Van der Vieren; Monica	Seattle	WA		

US-CL-CURRENT: 435/6; 435/7.2, 435/7.8, 536/25.4

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KMC	Draw D
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☐ 25. Document ID: US 5585246 A

L9: Entry 25 of 27

File: USPT

Dec 17, 1996

US-PAT-NO: 5585246

DOCUMENT-IDENTIFIER: US 5585246 A

**** See image for Certificate of Correction ****

TITLE: Method for preparing a sample in a scan capillary for immunofluorescent interrogation

DATE-ISSUED: December 17, 1996

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Dubrow; Robert S.	San Carlos	CA		
Manian; Bala S.	Los Altos Hills	CA		

US-CL-CURRENT: 435/7.24; 435/287.2, 435/288.3, 435/288.7, 435/40.51, 435/5, 435/6, 435/7.2, 435/7.21, 435/7.22, 435/7.32, 435/962, 435/968, 436/10, 436/17, 436/172, 436/18, 436/536, 436/805, 436/825, 436/826

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWIC	Draw D
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☐ 26. Document ID: US 5563060 A

L9: Entry 26 of 27

File: USPT

Oct 8, 1996

US-PAT-NO: 5563060

DOCUMENT-IDENTIFIER: US 5563060 A

TITLE: Micro-libraries for screening cell populations

DATE-ISSUED: October 8, 1996

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Hozier; John	Merritt Island	FL	32952	

US-CL-CURRENT: 435/346; 435/252.33, 435/254.22, 435/348, 435/419

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWIC	Draw D
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☐ 27. Document ID: US 5326691 A

L9: Entry 27 of 27

File: USPT

Jul 5, 1994

US-PAT-NO: 5326691

DOCUMENT-IDENTIFIER: US 5326691 A

TITLE: Micro-libraries and methods of making and manipulating them methods for generating and analyzing micro-libraries

DATE-ISSUED: July 5, 1994

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Hozier; John	Merritt Island	FL	32952	

US-CL-CURRENT: 435/6; 435/30, 435/7.2

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWIC	Draw D
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L15: Entry 1 of 24

File: USPT

Jan 25, 2005

US-PAT-NO: 6846622

DOCUMENT-IDENTIFIER: US 6846622 B1

TITLE: Tagged epitope protein transposable element

DATE-ISSUED: January 25, 2005

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Heffron; Fred L.	West Linn	OR		
Parker; David C.	Portland	OR		
Ellefson; Dolph D.	Portland	OR		

US-CL-CURRENT: 435/5; 435/29, 435/320.1, 435/6, 435/7.2, 435/7.31

CLAIMS:

We claim:

1. A method for identifying a protein secreted by an intracellular pathogen and having access to an MHC class I pathway of a eukaryotic cell infected with the intracellular pathogen, comprising: (i) transfecting intracellular pathogen with a transposable element, wherein the transposable element has a 3' and a 5' end and comprises a 5' recombining site 5' of a nucleic acid sequence encoding a selectable marker, a 3' recombining site 3' of the nucleic acid sequence encoding a selectable marker, a nucleic acid sequence encoding an MHC class I epitope 5' to the 5' recombining site or 3' to the 3' recombining site, and an insertion end comprising an inverted repeat sequence sufficient for integration of the transposable element at the 5' and the 3' end of the transposable element, and wherein the transfection results in the integration of the transposable element in a nucleic acid sequence of the intracellular pathogen; (ii) transforming the intracellular pathogen with a vector comprising a transposase; (iii) contacting a eukaryotic cell that can

internalize the intracellular pathogen with the pathogen transfected with the transposable element, wherein an MHC class I haplotype of the eukaryotic cell is matched to the MHC I epitope; (iv) contacting the eukaryotic cell with a labeled antibody that recognizes the MHC class I epitope, thereby generating a labeled eukaryotic cell; (v) identifying the labeled eukaryotic cell; (vi) lysing the labeled eukaryotic cell to externalize the intracellular pathogen; (vii) growing the externalized intracellular pathogen to produce a population of intracellular pathogen; and (viii) identifying the nucleic acid sequence of the intracellular pathogen that has the integrated transposable element, wherein the nucleic acid sequence encodes the secreted protein having access to an MHC class I pathway of eukaryotic cell infected with the intracellular pathogen.

2. The method of claim 1, wherein the eukaryotic cell is a cell of the immune system.

3. The method of claim 2, wherein the cell of the immune system is a macrophage.

4. The method of claim 1, wherein the identification of the labeled eukaryotic cell is by fluorescence activated cell sorting.

5. The method of claim 1, wherein the intracellular pathogen is a bacterial cell.

6. The method of claim 1, wherein the pathogen is Salmonella, Mycobacterium tuberculosis, Plasmodium, or Listeria monocytogenes.

7. The method of claim 1, wherein the 5' recombining site or the 3' recombining site is a loxP recombining site, a fit recombining site, a TN3 recombining site, a mariner recombining site, or a gamma/delta recombining site.

8. The method of claim 1, wherein the 5' recombining site or the 3' recombining site is a loxP recombining site.

9. The method of claim 8, wherein the loxP sequence comprises the sequence shown in SEQ ID NO: 11.

10. The method of claim 1, wherein the MHC class I epitope is SIINFEKL (SEQ ID NO: 6) and the MHC class I haplotype of the eukaryotic cell is H-2 Kb.

11. The method of claim 1, wherein the selectable marker is a nucleic acid encoding antibiotic resistance.

12. The method of claim 11, wherein the antibiotic resistance is ampicillin, kanamycin, zeomycin, hygromycin, tetracycline, puromycin or bleomycin resistance.

13. The method of claim 1, wherein the selectable marker is detected by spectrophotometric properties.

14. The method of claim 1, wherein the selectable marker is beta-galactosidase or green fluorescent protein.

15. The method of claim 1, wherein the insertion end at the 5' end of the transposable element is SEQ ID NO: 4 or SEQ ID NO: 5.

16. The method of claim 15, wherein the insertion end at the 5' end of the transposable element comprises the sequence shown in SEQ ID NO: 5.

17. The method of claim 1, wherein the insertion end at the 3' end of the transposable element is SEQ ID NO: 3 or SEQ ID NO: 4.

18. The method of claim 17, wherein the insertion end at the 3' end of the transposable element comprises the sequence shown in SEQ ID NO: 3.

19. The method of claim 1, wherein the transposable element further comprises a nucleic acid sequence encoding a transposase.

20. The method of claim 19, wherein the transposase is a Cre transposase.

21. The method of claim 1, wherein the transposable element further comprises an affinity tag.

22. The method of claim 21, wherein the affinity tag is 6.times. histidine, S-tag, glutathione-S-transferase, or streptavidin.

23. The method of claim 22, wherein the affinity tag is 6.times. histidine.

24. The method of claim 21, wherein the nucleic acid sequence encoding an affinity tag is 5' of the 5' recombining site.

25. The method of claim 21, wherein the nucleic acid sequence encoding an affinity tag is 3' of the 3' recombining site.

26. The method of claim 1, wherein the MHC class I epitope is LLFGYPVYV (SEQ ID NO: 7) and the MHC class I haplotype of the eukaryotic cell is HLA-A2.

27. A method for identifying a protein secreted by an intracellular pathogen and having access to an MHC class I pathway of a eukaryotic cell infected with the intracellular pathogen, comprising: (i) transfecting an intracellular pathogen expressing a transposase with a transposable element wherein the transposable element has a 3' and a 5' end and comprises a 5' recombining site 5' of a nucleic acid sequence encoding a selectable marker, a 3' recombining site 3' of the nucleic acid sequence encoding a selectable marker, a nucleic acid sequence encoding an MHC class I epitope 5' to the 5' recombining site or 3' to the 3' recombining site, and an insertion end comprising an inverted repeat sequence sufficient for integration of the transposable element at the 5' and the 3' end of the transposable element, and wherein the transfection results in the integration of the transposable element in a nucleic acid sequence of the intracellular pathogen; (ii) contacting a eukaryotic cell that can internalize the intracellular pathogen with the pathogen transfected with the

transposable element, wherein an MHC class I haplotype of the eukaryotic cell is matched to the MHC I epitope; (iiii) contacting the eukaryotic cell with a labeled antibody that recognizes the MHC class I epitope, thereby generating a labeled eukaryotic cell; (iv) identifying the labeled eukaryotic cell; (v) lysing the labeled eukaryotic cell to externalize the intracellular pathogen; (vi) growing the externalized pathogen to produce a population of intracellular pathogen; and (vii) identifying the nucleic acid sequence of the intracellular pathogen that has the integrated transposable element, wherein the nucleic acid sequence encodes the secreted protein having access to an MHC class I pathway of a eukaryotic cell infected with the intracellular pathogen.

28. The method of claim 27, wherein the 5' recombining site or the 3' recombining site is a loxP recombining site, a fit recombining site, a TN3 recombining site, a mariner recombining site, or a gamma/delta recombining site.

29. The method of claim 28, wherein the 5' recombining site or the 3' recombining site is a loxP recombining site.

30. The method of claim 29, wherein the loxP sequence comprises the sequence shown in SEQ ID NO: 11.

31. The method of claim 27, wherein the MHC class I epitope is SIINFEKL (SEQ ID NO: 6) and the MHC class I haplotype of the eukaryotic cell is H-2 Kb.

32. The method of claim 27, wherein the selectable marker is a nucleic acid encoding antibiotic resistance.

33. The method of claim 27, wherein the selectable marker is detected by spectrophotometric properties.

34. The method of claim 27, wherein the insertion end at the 5' end of the transposable element is SEQ ID NO: 4 or SEQ ID NO: 5.

35. The method of claim 27, wherein the insertion end at the 3' end of the transposable element is SEQ ID NO: 3 or SEQ ID NO: 4.

36. The method of claim 27, wherein the transposable element further comprises an affinity tag.

37. The method of claim 36, wherein the affinity tag is 6.times. histidine, S-tag, glutathione-S-transferase, or streptavidin.

38. The method of claim 36, wherein the nucleic acid sequence encoding an affinity tag is 5' of the 5' recombining site.

39. The method of claim 36, wherein the nucleic acid sequence encoding an affinity tag is 3' of the 3' recombining site.

40. The method of claim 27, wherein the MHC class I epitope is LLFGYPVYV (SEQ ID NO: 7) and the MHC class I haplotype of the eukaryotic cell is HLA-A2.

41. A method for identifying a protein secreted by an intracellular pathogen and having access to an MHC class I pathway of a eukaryotic cell infected with the intracellular pathogen, wherein the intracellular pathogen is a bacterial cell, comprising: (i) transfecting an intracellular pathogen with a transposable element, wherein the transposable element has a 3' and a 5' end and comprises a 5' recombining site 5' of a nucleic acid sequence encoding a selectable marker, a 3' recombining site 3' of the nucleic acid sequence encoding a selectable marker, a nucleic acid sequence encoding an MHC class I epitope 5' to the 5' recombining site or 3' to the 3' recombining site, an insertion end comprising an inverted repeat sequence sufficient for integration of the transposable element at the 5' and the 3' end of the transposable element, and a transposase, and wherein the transfection results in the integration of the transposable element in a nucleic acid sequence of the intracellular pathogen; (ii) contacting a eukaryotic cell that can internalize

the intracellular pathogen with the pathogen transfected with the transposable element, wherein an MHC class I haplotype of the eukaryotic cell is matched to the MHC I epitope; (iii) contacting the eukaryotic cell with a labeled antibody that recognizes the MHC class I epitope, thereby generating a labeled eukaryotic cell; (iv) identifying the labeled eukaryotic cell; (v) lysing the labeled eukaryotic cell to externalize the intracellular pathogen; (vi) growing the externalized bacterial cell to produce a population of intracellular pathogen; and (vii) identifying the nucleic acid sequence of the intracellular pathogen that has the integrated transposable element, wherein the nucleic acid sequence encodes the secreted protein having access to an MHC class I pathway of a eukaryotic cell infected with the intracellular pathogen.

42. The method of claim 41, wherein the 5' recombining site or the 3' recombining site is a loxP recombining site, a flt recombining site, a TN3 recombining site, a mariner recombining site, or a gamma/delta recombining site.

43. The method of claim 42, wherein the 5' recombining site or the 3' recombining site is a loxP recombining site.

44. The method of claim 43, wherein the loxP sequence comprises the sequence shown in SEQ ID NO: 11.

45. The method of claim 41, wherein the MHC I epitope is SIINFEKL (SEQ ID NO: 6) and the MHC class I haplotype of the eukaryotic cell is H-2 Kb.

46. The method of claim 41, wherein the selectable marker is a nucleic acid encoding antibiotic resistance.

47. The method of claim 41, wherein the selectable marker is detected by spectrophotometric properties.

48. The method of claim 41, wherein the insertion end at the 5' end of the transposable element is SEQ ID NO: 4 or SEQ ID NO: 5.

49. The method of claim 41, wherein the insertion end at the 3' end of the transposable element is SEQ ID NO: 3 or SEQ ID NO: 4.

50. The method of claim 46, wherein the transposable element further comprises an affinity tag.

51. The method of claim 50, wherein the affinity tag is 6.times. histidine, S-tag, glutathione-S-transferase, or streptavidin.

52. The method of claim 50, wherein the nucleic acid sequence encoding an affinity tag is 5' of the 5' recombining site.

53. The method of claim 50, wherein the nucleic acid sequence encoding an affinity tag is 3' of the 3' recombining site.

54. The method of claim 41, wherein the MHC class I epitope is LLFGYPVYV (SEQ ID NO: 7) and the MHC class I haplotype of the eukaryotic cell is HLA-A2.

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L15: Entry 3 of 24

File: USPT

Sep 21, 2004

US-PAT-NO: 6794128

DOCUMENT-IDENTIFIER: US 6794128 B2

TITLE: Methods of selecting internalizing antibodies

DATE-ISSUED: September 21, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Marks; James D.	Kensington	CA		
Poul; Marie Alix	San Francisco	CA		
Becerril; Baltazar	Morelos			MX

US-CL-CURRENT: 435/5; 435/320.1, 435/4, 435/6, 435/7.1, 435/7.2, 435/DIG.1,
435/DIG.14, 435/DIG.15, 435/DIG.2, 435/DIG.3 , 435/DIG.4, 436/501, 436/518,
536/23.1, 536/23.53

CLAIMS:

What is claimed is:

1. A method of selecting a polypeptide that is internalized into a target cell, said method comprising: i) contacting one or more target cells with one or more members of a phage display library displaying one or more polypeptides; ii) culturing the one or more target cells and enriching internalized library members under conditions where said internalized library members of said phage display library are enriched at least 30-fold as compared to on-internalized library members, wherein at least 30-fold enrichment is achieved in a single repetition of step I) and ii); and iii) identifying internalized library members of said phage display library, thereby selecting for a polypeptide that is internalized into the target cell.

2. The method of claim 1, wherein said phage display library is an antibody phage display library.

3. The method of claim 2, wherein said antibody phage

display library displays single chain antibody Fv regions.

4. The method of claim 1, wherein said identifying comprises recovering internalized phage and repeating steps (i) through (iii) to further select for internalizing binding moieties.

5. The method of claim 4, wherein said recovering comprises: (a) lysing said target cells to release internalized phage; and (b) infecting a bacterial host with said internalized phage to produce phage for a subsequent round of selection.

6. The method of claim 4, wherein said recovering comprises recovering nucleic acids encoding the phage-displayed antibody.

7. The method of claim 1, wherein said identifying comprises detecting expression of a reporter gene or a selectable marker.

8. The method of claim 1, wherein said target cells form an adherent layer in said method.

9. The method of claim 1, wherein said phage express a selectable marker.

10. The method of claim 9, wherein said selectable marker is selected from the group consisting of a fluorescent protein, an antibiotic resistance gene, and a chromagenic gene.

11. The library of claim 10, wherein said chromagenic gene is selected from the group consisting of horse radish peroxidase, B-lactamase, luciferase, and B-galactosidase.

12. The method of claim 1, wherein said target cells are selected from the group consisting of solid tumor cells, members of a cDNA expression library, cells that overexpress a cytokine receptor, cells that overexpress a growth factor receptor, metastatic cells, cells of a transformed cell line, cells transformed with a gene or

cDNA encoding a specific surface target receptor, and neoplastic cells derived from outside a solid tumor.

13. The method of claim 1, wherein said method further comprises contacting the members of the phage display library with cells of a subtractive cell line.

14. The method of claim 13, wherein said cells of a subtractive cell line are present in at least 2-fold excess over said target cells.

15. The method of claim 13, wherein said cells of a subtractive cell line are selected from the same tissue type as the target cells.

16. The method of claim 13, wherein said cells of a subtractive cell line are selected from the group consisting of fibroblasts, monocytes, stem cells, and lymphocytes.

17. The method of claim 13, wherein said method further comprises contacting the members of the phage display library with live cells of a subtractive cell line.

18. The method of claim 1, wherein culturing said target cells and enriching internalized library members comprises contacting the target cells with a low pH wash.

19. The method of claim 13, wherein culturing said target cells and enriching internalized library members comprises contacting the target cells with a low pH wash.

20. The method of claim 1, wherein culturing said target cells and enriching internalized library members comprises trypsinizing the target cells.

21. The method of claim 13, wherein culturing said target cells and enriching internalized library members comprises trypsinizing the target cells.

22. The method of claim 13, wherein the target cells are cells that are transformed a nucleic acid that encodes

and expresses a target receptor and the subtractive cell line is the non-transformed cell line.

23. A method of selecting a polypeptide that is internalized into a target cell, comprising: i) contacting one or more target cells with one or more members of a phage display library displaying one or more polypeptides; ii) culturing the one or more target cells under conditions wherein members of said phage display library bound to an internalizing marker become internalized; iii) reducing non-internalized members of said phage display library by removing phage trapped in an extracellular matrix; and iv) identifying members of said phage display library that are internalized into one or more of said target cells, where the internalized library members of said phage display library each display polypeptide that is internalized into a target cell.

24. The method of claim 23, wherein removing the phage trapped in the extracellular matrix comprises washing the one or more target cells with a stripping buffer comprising 50 mM glycine pH 2.8, 0.5 M NaCl, 2M urea, and 2% polyvinylpyrrolidone.

25. The method of claim 23, wherein removing the phage trapped in the extracellular matrix comprises trypsinizing the one or more target cells.

26. The method of claim 23, wherein said phage display library is an antibody phage display library.

27. The method of claim 23, wherein said antibody phage display library displays single chain antibody Fv regions.

28. The method of claim 23, wherein identifying the internalized library members comprises recovering internalized phage and repeating steps (i) through (iv) to further select for internalizing binding moieties.

29. The method of claim 28, wherein said recovering comprises: (a) lysing said target cells to release

internalized phase; and (b) infecting a bacterial host with said internalized phage to produce phage for a subsequent round of selection.

30. The method of claim 28, wherein said recovering comprises recovering nucleic acids encoding the phage-displayed antibody.

31. The method of claim 23, wherein identifying the internalized library members comprises detecting expression of a reporter gene or a selectable marker.

32. The method of claim 23, wherein said target cells form an adherent layer in said method.

33. The method of claim 23, wherein said phage express a selectable marker.

34. The method of claim 33, wherein said selectable marker is selected from the group consisting of a fluorescent protein, an antibiotic resistance gene, and a chromagenic gene.

35. The library of claim 34, wherein said chromagenic gene is selected from the group consisting of horse radish peroxidase, B-lactamase, luciferase, and B-galactosidase.

36. The method of claim 23, wherein said target cells are selected from the group consisting of solid tumor cells, members of a cDNA expression library, cells that overexpress a cytokine receptor, cells that overexpress a growth factor receptor, metastatic cells, cells of a transformed cell line, cells transformed with a gene or cDNA encoding a specific surface target receptor, and neoplastic cells derived from outside a solid tumor.

37. The method of claim 23, wherein said method further comprises contacting the members of the phage display library with cells of a subtractive cell line.

38. The method of claim 37, wherein said cells of a subtractive cell line are selected from the same tissue type as the target cells.

39. The method of claim 37, wherein said cells of a subtractive cell line are selected from the group consisting of fibroblasts, monocytes, stem cells, and lymphocytes.

40. The method of claim 37, wherein said cells of a subtractive cell line are present in at least 2-fold excess over said target cells.

41. The method of claim 37, wherein said cells of a subtractive cell line are live cells.

42. The method of claim 37, wherein the target cells are cells that are transformed a nucleic acid that encodes and expresses a target receptor and the subtractive cell line is the non-transformed cell line.

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☐ 1. Document ID: US 6846622 B1

L15: Entry 1 of 24

File: USPT

Jan 25, 2005

US-PAT-NO: 6846622

DOCUMENT-IDENTIFIER: US 6846622 B1

TITLE: Tagged epitope protein transposable element

DATE-ISSUED: January 25, 2005

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Heffron; Fred L.	West Linn	OR		
Parker; David C.	Portland	OR		
Ellefson; Dolph D.	Portland	OR		

US-CL-CURRENT: 435/5; 435/29, 435/320.1, 435/6, 435/7.2, 435/7.31

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	RMK	Draw D
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☐ 2. Document ID: US 6797480 B1

L15: Entry 2 of 24

File: USPT

Sep 28, 2004

US-PAT-NO: 6797480

DOCUMENT-IDENTIFIER: US 6797480 B1

TITLE: Purification of heat shock/stress protein cell surface receptors and their use as immunotherapeutic agents

DATE-ISSUED: September 28, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Srivastava; Pramod K.	Avon	CT		

US-CL-CURRENT: 435/7.1; 424/184.1, 424/278.1, 424/9.2, 435/325, 435/372.3, 435/7.2, 436/4, 436/6, 514/2

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWIC	Draw D
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☐ 3. Document ID: US 6794128 B2

L15: Entry 3 of 24

File: USPT

Sep 21, 2004

US-PAT-NO: 6794128

DOCUMENT-IDENTIFIER: US 6794128 B2

TITLE: Methods of selecting internalizing antibodies

DATE-ISSUED: September 21, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Marks; James D.	Kensington	CA		
Poul; Marie Alix	San Francisco	CA		
Becerril; Baltazar	Morelos			MX

US-CL-CURRENT: 435/5; 435/320.1, 435/4, 435/6, 435/7.1, 435/7.2, 435/DIG.1,
435/DIG.14, 435/DIG.15, 435/DIG.2, 435/DIG.3 , 435/DIG.4, 436/501, 436/518,
536/23.1, 536/23.53

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWIC	Draw D
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☐ 4. Document ID: US 6770449 B2

L15: Entry 4 of 24

File: USPT

Aug 3, 2004

US-PAT-NO: 6770449

DOCUMENT-IDENTIFIER: US 6770449 B2

TITLE: Methods of assaying receptor activity and constructs useful in such methods

DATE-ISSUED: August 3, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Barak; Lawrence S.	Durham	NC		
Caron; Marc G.	Hillsborough	NC		
Ferguson; Stephen S.	London			CA
Zhang; Jie	Durham	NC		

US-CL-CURRENT: 435/7.2; 435/325, 435/4, 435/7.1, 530/350

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWIC	Draw D
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☐ 5. Document ID: US 6709830 B2

L15: Entry 5 of 24

File: USPT

Mar 23, 2004

US-PAT-NO: 6709830

DOCUMENT-IDENTIFIER: US 6709830 B2

TITLE: Methods for modulating the activation of a lymphocyte expressed G protein coupled receptor involved in cell proliferation, autoimmunity and inflammation

DATE-ISSUED: March 23, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Witte; Owen N.	Sherman Oaks	CA		
Weng; Zhigang	Brookline	MA		
Le; Lu Q.	Los Angeles	CA		
Kabarowski; Janusz H. S.	Los Angeles	CA		
Xu; Yan	Pepper Pike	OH		
Zhu; Kui	Richmond Heights	OH		

US-CL-CURRENT: 435/7.1; 435/252.3, 435/325, 435/69.1, 435/7.2, 435/7.21, 536/23.1, 536/24.3

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWC	Draw D
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☐ 6. Document ID: US 6649414 B1

L15: Entry 6 of 24

File: USPT

Nov 18, 2003

US-PAT-NO: 6649414

DOCUMENT-IDENTIFIER: US 6649414 B1

**** See image for Certificate of Correction ****

TITLE: Microparticles with multiple fluorescent signals and methods of using same

DATE-ISSUED: November 18, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Chandler; Mark B.	Austin	TX		
Chandler; Don J.	Austin	TX		

US-CL-CURRENT: 436/63; 422/61, 435/6, 435/7.1, 435/810, 435/975, 436/164, 436/166, 436/172, 436/19, 436/518, 436/523, 436/534, 436/8, 436/805, 436/808, 436/823

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWC	Draw D
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☐ 7. Document ID: US 6630140 B1

L15: Entry 7 of 24

File: USPT

Oct 7, 2003

US-PAT-NO: 6630140

DOCUMENT-IDENTIFIER: US 6630140 B1

TITLE: Compositions and methods for treatment of asthma

DATE-ISSUED: October 7, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Grunstein; Michael M.	Merion	PA		
Hakonarson; Hakon	Reykjavic			IS

US-CL-CURRENT: 424/133.1; 424/143.1, 514/2

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWC	Draw D
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☐ 8. Document ID: US 6498015 B1

L15: Entry 8 of 24

File: USPT

Dec 24, 2002

US-PAT-NO: 6498015

DOCUMENT-IDENTIFIER: US 6498015 B1

**** See image for Certificate of Correction ****TITLE: Methods of identifying agents that modulate the binding between MDC and an MDC receptor

DATE-ISSUED: December 24, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Godiska; Ronald	Verona	WI		
Gray; Patrick W.	Seattle	WA		
Raport; Carol J.	Bothell	WA		

US-CL-CURRENT: 435/7.24; 435/320.1, 435/325, 435/440, 435/69.1, 435/7.1, 435/7.2, 436/501

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWC	Draw D
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☐ 9. Document ID: US 6352694 B1

L15: Entry 9 of 24

File: USPT

Mar 5, 2002

US-PAT-NO: 6352694

DOCUMENT-IDENTIFIER: US 6352694 B1

**** See image for Certificate of Correction ****

TITLE: Methods for inducing a population of T cells to proliferate using agents which recognize TCR/CD3 and ligands which stimulate an accessory molecule on the surface of the T cells

DATE-ISSUED: March 5, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
June; Carl H.	Rockville	MD		
Thompson; Craig B.	Chicago	IL		
Nabel; Gary J.	Ann Arbor	MI		
Gray; Gary S.	Brookline	MA		
Rennert; Paul D.	Holliston	MA		

US-CL-CURRENT: 424/93.71; 424/534, 424/577, 424/578, 424/93.7, 435/2, 435/375, 435/377

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWIC	Draw D
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☐ 10. Document ID: US 6284474 B1

L15: Entry 10 of 24

File: USPT

Sep 4, 2001

US-PAT-NO: 6284474

DOCUMENT-IDENTIFIER: US 6284474 B1

TITLE: Detection and diagnosis of conditions associated with lung injury

DATE-ISSUED: September 4, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Dobbs; Leland G.	Oakland	CA		
Gonzalez; Robert	San Francisco	CA		

US-CL-CURRENT: 435/7.21; 435/7.7, 435/7.72, 435/7.92, 435/8, 530/388.2, 530/388.85, 530/389.1

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWIC	Draw D
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☐ 11. Document ID: US 6222027 B1

L15: Entry 11 of 24

File: USPT

Apr 24, 2001

US-PAT-NO: 6222027

DOCUMENT-IDENTIFIER: US 6222027 B1

TITLE: Molecules expressed in hippocampus

DATE-ISSUED: April 24, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Kaser; Matthew R.	Castro Valley	CA		
Lal; Preeti	Santa Clara	CA		
Yue; Henry	Sunnyvale	CA		
Tang; Y. Tom	San Jose	CA		
Baughn; Mariah R.	San Leandro	CA		
Azimzai; Yalda	Hayward	CA		

US-CL-CURRENT: 536/23.1; 435/252.3, 435/320.1, 435/6, 435/69.52, 435/7.1, 435/7.2,
435/803, 435/91.3, 436/501, 436/808, 436/811, 436/94, 530/300, 530/350, 530/387.1,
536/23.5, 536/24.31, 536/25.1

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWIC	Draw D
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☐ 12. Document ID: US 6110693 A

L15: Entry 12 of 24

File: USPT

Aug 29, 2000

US-PAT-NO: 6110693

DOCUMENT-IDENTIFIER: US 6110693 A

TITLE: Methods of assaying receptor activity and constructs useful in such methods

DATE-ISSUED: August 29, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Barak; Lawrence S.	Durham	NC		

Caron; Marc G.	Hillsborough	NC	
Ferguson; Stephen S.	London		CA
Zhang; Jie	Durham	NC	

US-CL-CURRENT: 435/7.2; 435/69.1, 435/7.1, 530/350, 536/23.4

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWIC	Draw D
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☐ 13. Document ID: US 6013188 A

L15: Entry 13 of 24

File: USPT

Jan 11, 2000

US-PAT-NO: 6013188

DOCUMENT-IDENTIFIER: US 6013188 A

TITLE: Methods for biological substance analysis employing internal magnetic gradients separation and an externally-applied transport force

DATE-ISSUED: January 11, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Terstappen; Leon W. M. M.	Huntingdon	PA		
Liberti; Paul A.	Huntingdon	PA		

US-CL-CURRENT: 210/695; 209/214, 209/223.1, 210/745, 435/7.2, 436/172, 436/177, 436/526

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWIC	Draw D
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☐ 14. Document ID: US 5993665 A

L15: Entry 14 of 24

File: USPT

Nov 30, 1999

US-PAT-NO: 5993665

DOCUMENT-IDENTIFIER: US 5993665 A

TITLE: Quantitative cell analysis methods employing magnetic separation

DATE-ISSUED: November 30, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Terstappen; Leon W. M. M.	Huntingdon	PA		
Liberti; Paul A.	Huntingdon	PA		

US-CL-CURRENT: 210/695; 209/214, 209/223.1, 210/745, 356/336, 435/7.2, 436/177, 436/18, 436/526

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWIC	Draw D
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☐ 15. Document ID: US 5989843 A

L15: Entry 15 of 24

File: USPT

Nov 23, 1999

US-PAT-NO: 5989843

DOCUMENT-IDENTIFIER: US 5989843 A

TITLE: Methods for identifying modulators of protein kinase C phosphorylation of ICAM-related protein

DATE-ISSUED: November 23, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Gallatin; W. Michael	Mercer Island	WA		
Vazeux; Rosemay	Seattle	WA		

US-CL-CURRENT: 435/15; 435/4

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWIC	Draw D
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☐ 16. Document ID: US 5985153 A

L15: Entry 16 of 24

File: USPT

Nov 16, 1999

US-PAT-NO: 5985153

DOCUMENT-IDENTIFIER: US 5985153 A

TITLE: Magnetic separation apparatus and methods employing an internal magnetic capture gradient and an external transport force

DATE-ISSUED: November 16, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Dolan; Gerald J.	Philadelphia	PA		
Terstappen; Leon W. M. M.	Huntingdon	PA		

US-CL-CURRENT: 210/695; 209/214, 209/223.1, 210/222, 210/745, 210/94, 356/336, 435/7.2, 436/172, 436/177, 436/526

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWIC	Draw D
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☐ 17. Document ID: US 5891646 A

L15: Entry 17 of 24

File: USPT

Apr 6, 1999

US-PAT-NO: 5891646

DOCUMENT-IDENTIFIER: US 5891646 A

TITLE: Methods of assaying receptor activity and constructs useful in such methods

DATE-ISSUED: April 6, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Barak; Lawrence S.	Durham	NC		
Caron; Marc G.	Hillsborough	NC		
Ferguson; Stephen S.	London			CA
Zhang; Jie	Durham	NC		

US-CL-CURRENT: 435/7.2; 435/69.1, 435/7.1, 530/350, 536/23.4

Full	Title	Citation	Front	Review	Classification	Date	Reference				Claims	KWIC	Draw D
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☐ 18. Document ID: US 5830670 A

L15: Entry 18 of 24

File: USPT

Nov 3, 1998

US-PAT-NO: 5830670

DOCUMENT-IDENTIFIER: US 5830670 A

TITLE: Neural thread protein gene expression and detection of Alzheimer's disease

DATE-ISSUED: November 3, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
de la Monte; Suzanne	Cambridge	MA		
Wands; Jack R.	Waban	MA		

US-CL-CURRENT: 435/7.2; 435/40.52, 435/7.1, 435/7.92, 436/63

Full	Title	Citation	Front	Review	Classification	Date	Reference				Claims	KWIC	Draw D
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☐ 19. Document ID: US 5773218 A

L15: Entry 19 of 24

File: USPT

Jun 30, 1998

US-PAT-NO: 5773218

DOCUMENT-IDENTIFIER: US 5773218 A

**** See image for Certificate of Correction ****TITLE: Method to identify compounds which modulate ICAM-related protein interactions

DATE-ISSUED: June 30, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Gallatin; W. Michael	Seattle	WA		
Vazeux; Rosemay	Seattle	WA		

US-CL-CURRENT: 435/6

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KUMC	Draw D
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☐ 20. Document ID: US 5753516 A

L15: Entry 20 of 24

File: USPT

May 19, 1998

US-PAT-NO: 5753516

DOCUMENT-IDENTIFIER: US 5753516 A

TITLE: Screening method for ligands of the EBI-1 receptor

DATE-ISSUED: May 19, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Heagy; Wyrta E.	Golden Valley	MN	55427	
Finberg; Robert W.	Canton	MA	02021	

US-CL-CURRENT: 436/501; 435/6, 435/7.1, 435/7.2, 435/7.8

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KUMC	Draw D
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L15: Entry 20 of 24

File: USPT

May 19, 1998

US-PAT-NO: 5753516

DOCUMENT-IDENTIFIER: US 5753516 A

TITLE: Screening method for ligands of the EBI-1 receptor

DATE-ISSUED: May 19, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Heagy; Wyrta E.	Golden Valley	MN	55427	
Finberg; Robert W.	Canton	MA	02021	

US-CL-CURRENT: [436/501](#); [435/6](#), [435/7.1](#), [435/7.2](#), [435/7.8](#)

CLAIMS:

What is claimed is:

1. A process of screening a candidate substance for its ability to interact with a lymphocyte receptor said process comprising:

a) providing a lymphocyte receptor protein having an amino acid sequence as contained in SEQ ID NO:2;

b) selecting a candidate substance having a chemical structure or biological activity suggestive of an ability to mimic the biological activity of an opiate, opioid drug or opioid peptide having a known binding affinity to the lymphocyte receptor protein; and

c) testing the ability of a selected candidate substance to interact with said lymphocyte receptor protein.

2. A process of screening a candidate substance for its ability to interact with a lymphocyte receptor, said process comprising:

a) providing a lymphocyte receptor protein by (i)

transfecting a host cell with a nucleotide sequence contained in SEQ ID NO:1 so as to form a transformed cell effective for encoding a lymphocyte receptor polypeptide, and (ii) maintaining said transformed cell under biological conditions sufficient for translation of said nucleotide sequence so as to express said lymphocyte receptor polypeptide:

b) selecting a candidate substance having a chemical structure or biological activity suggestive of an ability to mimic the biological activity of an opiate, opioid drug or opioid peptide having a known binding affinity to the lymphocyte receptor protein; and

c) testing the ability of a selected candidate substance to interact with said lymphocyte receptor protein.

3. The process according to claim 1, wherein providing said lymphocyte receptor polypeptide having an amino acid sequence as contained in SEQ ID NO 2, comprises (i) transfecting a host cell with a polynucleotide that encodes the lymphocyte receptor polypeptide having an amino acid sequence as contained in SEQ ID NO.2 to form a transformed cell, and (ii) maintaining said transformed cell under biological conditions sufficient for expression of said lymphocyte receptor polypeptide.

4. A process of making a product having an ability to interact with a lymphocyte receptor said process comprising:

a) providing a lymphocyte receptor polypeptide having an amino acid sequence as contained in SEQ ID NO:2;

b) selecting a candidate substance having a chemical structure or biological activity suggestive of an ability to mimic the biological activity of an opiate, opioid drug or opioid peptide having a known binding affinity to the lymphocyte receptor polypeptide:

c) testing the ability of selected candidate substance to interact with said lymphocyte receptor polypeptide; and

d) providing a product of a candidate substance established in step c to interact with the lymphocyte receptor polypeptide.

5. The process according to claim 4, wherein providing said lymphocyte receptor polypeptide having an amino acid sequence as contained in SEQ ID NO:2, comprises (i) transfecting a host cell with a polynucleotide that encodes the lymphocyte receptor polypeptide having an amino acid sequence as contained in SEQ ID NO:2 to form a transformed cell and (ii) maintaining said transformed cell under biological conditions sufficient for expression of said lymphocyte receptor polypeptide having an amino acid sequence as contained in SEQ ID NO 2.

6. A process of making a product having an ability to interact with a lymphocyte receptor, said process comprising:

a) providing a lymphocyte receptor protein by (i) transfecting a host cell with a nucleotide sequence contained in SEQ ID NO:1 so as to form a transformed cell effective for encoding a lymphocyte receptor polypeptide, and (ii) maintaining said transformed cell under biological conditions sufficient for translation of said nucleotide sequence and expression of said lymphocyte receptor polypeptide;

b) selecting a candidate substance having a chemical structure or biological activity suggestive of an ability to mimic the biological activity of an opiate, opioid drug or opioid peptide having a known binding affinity to the lymphocyte receptor polypeptide;

c) testing the ability of a selected candidate substance to interact with said lymphocyte receptor polypeptide; and

d) providing a product of a candidate substance established in step c to interact with the lymphocyte receptor polypeptide.

7. A process of screening a substance for its ability to interact with an immune-cell specific lymphocyte receptor and a neuronal type opioid receptor, said process comprising:

a) providing an immune-cell specific lymphocyte receptor polypeptide having an amino acid sequence as contained in SEQ ID NO:2.

b) testing the ability of a substance to interact with said immune-cell specific lymphocyte receptor;

c) providing a neuronal type opioid receptor polypeptide; and

d) testing the ability of said substance to interact with said neuronal type opioid receptor polypeptide.

8. A process of screening a substance for its ability to interact with an immune-cell specific lymphocyte receptor and a neuronal type opioid receptor, said process comprising:

a) providing an immune-cell specific lymphocyte receptor polypeptide by (i) transfecting a host cell with a nucleotide sequence contained SEQ ID NO:1 so as to form a transformed cell effective or encoding an immune-cell specific lymphocyte receptor polypeptide and (ii) maintaining said transformed cell under biological conditions sufficient for translation of the nucleotide sequence and expression of said immune-cell specific lymphocyte receptor polypeptide;

b) testing the ability of a substance to interact said immune-cell specific lymphocyte receptor;

c) providing a neuronal type opioid receptor polypeptide; and

d) testing the ability of said substance to interact with said neuronal type opioid receptor polypeptide.

9. The process according to claim 8, wherein the

expressed immune-cell specific lymphocyte receptor polypeptide has an amino acid sequence a contained in SEQ ID NO:2.

10. The process according to claim 8, wherein the polynucleotide has a nucleotide sequence as contained in SEQ ID NO:1.

11. The process according to claim 7, wherein the neuronal type opioid receptor is a .kappa., .mu., or .delta. opioid receptor.

12. The process according to claim 7, wherein the step of providing said neuronal type opioid receptor polypeptide comprises (i) transfecting a host cell with a polynucleotide that encodes the neuronal type opioid receptor polypeptide to form a transformed cell, and (ii) maintaining said transformed cell under biological conditions sufficient for expression of said neuronal type opioid receptor polypeptide.

13. The process according to claim 1 wherein the candidate substance is screened for its ability to act as an agonist or antagonist to said lymphocyte receptor protein.

14. The process according to claim 7 wherein the candidate substance is screened for its ability to act as an agonist or antagonist to said immune-cell specific lymphocyte receptor polypeptide.

15. The process according to claim 7 wherein the candidate substance is screened for its ability to act as an agonist or antagonist to said neuronal type opioid receptor polypeptide.

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☐ 11. Document ID: US 6222027 B1

L15: Entry 11 of 24

File: USPT

Apr 24, 2001

US-PAT-NO: 6222027

DOCUMENT-IDENTIFIER: US 6222027 B1

TITLE: Molecules expressed in hippocampus

DATE-ISSUED: April 24, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Kaser; Matthew R.	Castro Valley	CA		
Lal; Preeti	Santa Clara	CA		
Yue; Henry	Sunnyvale	CA		
Tang; Y. Tom	San Jose	CA		
Baughn; Mariah R.	San Leandro	CA		
Azimzai; Yalda	Hayward	CA		

US-CL-CURRENT: 536/23.1, 435/252.3, 435/320.1, 435/6, 435/69.52, 435/7.1, 435/7.2,
435/803, 435/91.3, 436/501, 436/808, 436/811, 436/94, 530/300, 530/350, 530/387.1,
536/23.5, 536/24.31, 536/25.1

Full	Title	Citation	Front	Review	Classification	Date	Reference				Claims	KWIC	Draw
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☐ 12. Document ID: US 6110693 A

L15: Entry 12 of 24

File: USPT

Aug 29, 2000

US-PAT-NO: 6110693

DOCUMENT-IDENTIFIER: US 6110693 A

TITLE: Methods of assaying receptor activity and constructs useful in such methods

DATE-ISSUED: August 29, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Barak; Lawrence S.	Durham	NC		

Caron; Marc G.	Hillsborough	NC	
Ferguson; Stephen S.	London		CA
Zhang; Jie	Durham	NC	

US-CL-CURRENT: 435/7.2; 435/69.1, 435/7.1, 530/350, 536/23.4

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWIC	Draw D
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☐ 13. Document ID: US 6013188 A

L15: Entry 13 of 24

File: USPT

Jan 11, 2000

US-PAT-NO: 6013188

DOCUMENT-IDENTIFIER: US 6013188 A

TITLE: Methods for biological substance analysis employing internal magnetic gradients separation and an externally-applied transport force

DATE-ISSUED: January 11, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Terstappen; Leon W. M. M.	Huntingdon	PA		
Liberti; Paul A.	Huntingdon	PA		

US-CL-CURRENT: 210/695; 209/214, 209/223.1, 210/745, 435/7.2, 436/172, 436/177, 436/526

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWIC	Draw D
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☐ 14. Document ID: US 5993665 A

L15: Entry 14 of 24

File: USPT

Nov 30, 1999

US-PAT-NO: 5993665

DOCUMENT-IDENTIFIER: US 5993665 A

TITLE: Quantitative cell analysis methods employing magnetic separation

DATE-ISSUED: November 30, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Terstappen; Leon W. M. M.	Huntingdon	PA		
Liberti; Paul A.	Huntingdon	PA		

US-CL-CURRENT: 210/695; 209/214, 209/223.1, 210/745, 356/336, 435/7.2, 436/177, 436/18, 436/526

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWIC	Draw D
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☐ 15. Document ID: US 5989843 A

L15: Entry 15 of 24

File: USPT

Nov 23, 1999

US-PAT-NO: 5989843

DOCUMENT-IDENTIFIER: US 5989843 A

TITLE: Methods for identifying modulators of protein kinase C phosphorylation of ICAM-related protein

DATE-ISSUED: November 23, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Gallatin; W. Michael	Mercer Island	WA		
Vazeux; Rosemay	Seattle	WA		

US-CL-CURRENT: 435/15; 435/4

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWIC	Draw D
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☐ 16. Document ID: US 5985153 A

L15: Entry 16 of 24

File: USPT

Nov 16, 1999

US-PAT-NO: 5985153

DOCUMENT-IDENTIFIER: US 5985153 A

TITLE: Magnetic separation apparatus and methods employing an internal magnetic capture gradient and an external transport force

DATE-ISSUED: November 16, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Dolan; Gerald J.	Philadelphia	PA		
Terstappen; Leon W. M. M.	Huntingdon	PA		

US-CL-CURRENT: 210/695; 209/214, 209/223.1, 210/222, 210/745, 210/94, 356/336, 435/7.2, 436/172, 436/177, 436/526

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWIC	Draw D
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☐ 17. Document ID: US 5891646 A

L15: Entry 17 of 24

File: USPT

Apr 6, 1999

US-PAT-NO: 5891646
DOCUMENT-IDENTIFIER: US 5891646 A

TITLE: Methods of assaying receptor activity and constructs useful in such methods

DATE-ISSUED: April 6, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Barak; Lawrence S.	Durham	NC		
Caron; Marc G.	Hillsborough	NC		
Ferguson; Stephen S.	London			CA
Zhang; Jie	Durham	NC		

US-CL-CURRENT: 435/7.2; 435/69.1, 435/7.1, 530/350, 536/23.4

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWIC	Draw D
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☐ 18. Document ID: US 5830670 A

L15: Entry 18 of 24

File: USPT

Nov 3, 1998

US-PAT-NO: 5830670
DOCUMENT-IDENTIFIER: US 5830670 A

TITLE: Neural thread protein gene expression and detection of Alzheimer's disease

DATE-ISSUED: November 3, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
de la Monte; Suzanne	Cambridge	MA		
Wands; Jack R.	Waban	MA		

US-CL-CURRENT: 435/7.2; 435/40.52, 435/7.1, 435/7.92, 436/63

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWIC	Draw D
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☐ 19. Document ID: US 5773218 A

L15: Entry 19 of 24

File: USPT

Jun 30, 1998

US-PAT-NO: 5773218
DOCUMENT-IDENTIFIER: US 5773218 A

**** See image for Certificate of Correction ****

TITLE: Method to identify compounds which modulate ICAM-related protein interactions

DATE-ISSUED: June 30, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Gallatin; W. Michael	Seattle	WA		
Vazeux; Rosemay	Seattle	WA		

US-CL-CURRENT: 435/6

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KMCD	Draw D
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☐ 20. Document ID: US 5753516 A

L15: Entry 20 of 24

File: USPT

May 19, 1998

US-PAT-NO: 5753516

DOCUMENT-IDENTIFIER: US 5753516 A

TITLE: Screening method for ligands of the EBI-1 receptor

DATE-ISSUED: May 19, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Heagy; Wyrta E.	Golden Valley	MN	55427	
Finberg; Robert W.	Canton	MA	02021	

US-CL-CURRENT: 436/501; 435/6, 435/7.1, 435/7.2, 435/7.8

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KMCD	Draw D
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☐ 11. Document ID: US 6222027 B1

L15: Entry 11 of 24

File: USPT

Apr 24, 2001

US-PAT-NO: 6222027

DOCUMENT-IDENTIFIER: US 6222027 B1

TITLE: Molecules expressed in hippocampus

DATE-ISSUED: April 24, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Kaser; Matthew R.	Castro Valley	CA		
Lal; Preeti	Santa Clara	CA		
Yue; Henry	Sunnyvale	CA		
Tang; Y. Tom	San Jose	CA		
Baughn; Mariah R.	San Leandro	CA		
Azimzai; Yalda	Hayward	CA		

US-CL-CURRENT: [536/23.1](#); [435/252.3](#), [435/320.1](#), [435/6](#), [435/69.52](#), [435/7.1](#), [435/7.2](#),
[435/803](#), [435/91.3](#), [436/501](#), [436/808](#), [436/811](#), [436/94](#), [530/300](#), [530/350](#), [530/387.1](#),
[536/23.5](#), [536/24.31](#), [536/25.1](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference	Claims	KWC	Draw
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☐ 12. Document ID: US 6110693 A

L15: Entry 12 of 24

File: USPT

Aug 29, 2000

US-PAT-NO: 6110693

DOCUMENT-IDENTIFIER: US 6110693 A

TITLE: Methods of assaying receptor activity and constructs useful in such methods

DATE-ISSUED: August 29, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Barak; Lawrence S.	Durham	NC		

Caron; Marc G.	Hillsborough	NC	
Ferguson; Stephen S.	London		CA
Zhang; Jie	Durham	NC	

US-CL-CURRENT: 435/7.2; 435/69.1, 435/7.1, 530/350, 536/23.4

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWIC	Draw D
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☐ 13. Document ID: US 6013188 A

L15: Entry 13 of 24

File: USPT

Jan 11, 2000

US-PAT-NO: 6013188

DOCUMENT-IDENTIFIER: US 6013188 A

TITLE: Methods for biological substance analysis employing internal magnetic gradients separation and an externally-applied transport force

DATE-ISSUED: January 11, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Terstappen; Leon W. M. M.	Huntingdon	PA		
Liberti; Paul A.	Huntingdon	PA		

US-CL-CURRENT: 210/695; 209/214, 209/223.1, 210/745, 435/7.2, 436/172, 436/177, 436/526

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWIC	Draw D
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☐ 14. Document ID: US 5993665 A

L15: Entry 14 of 24

File: USPT

Nov 30, 1999

US-PAT-NO: 5993665

DOCUMENT-IDENTIFIER: US 5993665 A

TITLE: Quantitative cell analysis methods employing magnetic separation

DATE-ISSUED: November 30, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Terstappen; Leon W. M. M.	Huntingdon	PA		
Liberti; Paul A.	Huntingdon	PA		

US-CL-CURRENT: 210/695; 209/214, 209/223.1, 210/745, 356/336, 435/7.2, 436/177, 436/18, 436/526

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWIC	Draw D
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☐ 15. Document ID: US 5989843 A

L15: Entry 15 of 24

File: USPT

Nov 23, 1999

US-PAT-NO: 5989843

DOCUMENT-IDENTIFIER: US 5989843 A

TITLE: Methods for identifying modulators of protein kinase C phosphorylation of ICAM-related protein

DATE-ISSUED: November 23, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Gallatin; W. Michael	Mercer Island	WA		
Vazeux; Rosemay	Seattle	WA		

US-CL-CURRENT: 435/15; 435/4

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWIC	Draw D
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☐ 16. Document ID: US 5985153 A

L15: Entry 16 of 24

File: USPT

Nov 16, 1999

US-PAT-NO: 5985153

DOCUMENT-IDENTIFIER: US 5985153 A

TITLE: Magnetic separation apparatus and methods employing an internal magnetic capture gradient and an external transport force

DATE-ISSUED: November 16, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Dolan; Gerald J.	Philadelphia	PA		
Terstappen; Leon W. M. M.	Huntingdon	PA		

US-CL-CURRENT: 210/695; 209/214, 209/223.1, 210/222, 210/745, 210/94, 356/336, 435/7.2, 436/172, 436/177, 436/526

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWIC	Draw D
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☐ 17. Document ID: US 5891646 A

L15: Entry 17 of 24

File: USPT

Apr 6, 1999

US-PAT-NO: 5891646
DOCUMENT-IDENTIFIER: US 5891646 A

TITLE: Methods of assaying receptor activity and constructs useful in such methods

DATE-ISSUED: April 6, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Barak; Lawrence S.	Durham	NC		
Caron; Marc G.	Hillsborough	NC		
Ferguson; Stephen S.	London			CA
Zhang; Jie	Durham	NC		

US-CL-CURRENT: 435/7.2; 435/69.1, 435/7.1, 530/350, 536/23.4

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWIC	Draw D
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☐ 18. Document ID: US 5830670 A

L15: Entry 18 of 24

File: USPT

Nov 3, 1998

US-PAT-NO: 5830670
DOCUMENT-IDENTIFIER: US 5830670 A

TITLE: Neural thread protein gene expression and detection of Alzheimer's disease

DATE-ISSUED: November 3, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
de la Monte; Suzanne	Cambridge	MA		
Wands; Jack R.	Waban	MA		

US-CL-CURRENT: 435/7.2; 435/40.52, 435/7.1, 435/7.92, 436/63

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWIC	Draw D
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☐ 19. Document ID: US 5773218 A

L15: Entry 19 of 24

File: USPT

Jun 30, 1998

US-PAT-NO: 5773218
DOCUMENT-IDENTIFIER: US 5773218 A

**** See image for Certificate of Correction ****

TITLE: Method to identify compounds which modulate ICAM-related protein interactions

DATE-ISSUED: June 30, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Gallatin; W. Michael	Seattle	WA		
Vazeux; Rosemay	Seattle	WA		

US-CL-CURRENT: 435/6

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KOMC	Draw D
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☐ 20. Document ID: US 5753516 A

L15: Entry 20 of 24

File: USPT

May 19, 1998

US-PAT-NO: 5753516

DOCUMENT-IDENTIFIER: US 5753516 A

TITLE: Screening method for ligands of the EBI-1 receptor

DATE-ISSUED: May 19, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Heagy; Wyrta E.	Golden Valley	MN	55427	
Finberg; Robert W.	Canton	MA	02021	

US-CL-CURRENT: 436/501; 435/6, 435/7.1, 435/7.2, 435/7.8

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KOMC	Draw D
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File: USPT

Apr 6, 1999

US-PAT-NO: 5891646

DOCUMENT-IDENTIFIER: US 5891646 A

TITLE: Methods of assaying receptor activity and constructs useful in such methods

DATE-ISSUED: April 6, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Barak; Lawrence S.	Durham	NC		
Caron; Marc G.	Hillsborough	NC		
Ferguson; Stephen S.	London			CA
Zhang; Jie	Durham	NC		

US-CL-CURRENT: 435/7.2; 435/69.1, 435/7.1, 530/350, 536/23.4

CLAIMS:

That which is claimed:

1. A method of assessing the effect of a test condition on G protein coupled receptor (GPCR) pathway activity, comprising:

a) providing a cell that expresses a GPCR, and that contains a conjugate comprising a .beta.-arrestin protein and an optically detectable molecule;

b) exposing the cell to an agonist for said GPCR under said test condition;

c) detecting translocation of the detectable molecule from the cytosol of the cell to the membrane edge of the cell; and then

d) comparing any translocation detected in step (c) to that which occurs in the absence of said test condition;

wherein increased translocation of the detectable molecule in the cell compared to that which occurs in

the absence of said test condition indicates increased GPCR activation compared to activation that occurs in the absence of said test condition, and decreased translocation of the detectable molecule in the cell compared to that which occurs in the absence of said test condition indicates decreased GPCR compared to activation that occurs in the absence of said test condition.

2. A method according to claim 1, wherein the test condition is the presence in the cell of a kinase.

3. A method according to claim 1, wherein the test condition is the presence in the cell of a G-protein.

4. A method according to claim 1, wherein the test condition is the exposure of the cell to a compound selected from GPCR agonists and GPCR antagonists.

5. A method according to claim 1 wherein the test condition is co-expression in the cell of a second receptor.

6. A method for screening a .beta.-arrestin protein or fragment thereof for the ability to bind to phosphorylated GPCRs, comprising:

a) providing a cell that:

i) expresses at least one GPCR; and

ii) contains a conjugate comprising a test .beta.-arrestin protein and an optically detectable molecule;

b) exposing the cell to an agonist for said at least one GPCR; and then

c) detecting translocation of the detectable molecule from the cytosol of the cell to the membrane edge of the cell;

wherein translocation of the detectable molecule in the cell indicates .beta.-arrestin protein binding to the phosphorylated GPCR.

7. A method for screening a test compound for G protein coupled receptor (GPCR) agonist activity, comprising:

- a) providing a cell expressing a GPCR and containing a conjugate comprising a .beta.-arrestin protein and an optically detectable molecule;
- b) exposing the cell to a test compound; and then
- c) detecting translocation of the detectable molecule from the cytosol of the cell to the membrane edge of the cell;

wherein movement of the detectable molecule from the cytosol to the membrane edge of the cell after exposure of the cell to the test compound indicates GPCR agonist activity of the test compound.

8. A method according to claim 7 wherein the cell expresses a GPCR whose function is known.

9. A method according to claim 7 wherein the cell expresses a GPCR whose function is unknown.

10. A method according to claim 7 wherein the cell expresses an odorant GPCR.

11. A method according to claim 7 wherein the cell expresses a .beta.-adrenergic GPCR.

12. A method according to claim 7 wherein the detectable molecule is Green Fluorescent Protein.

13. A method according to claim 7 wherein the cell is a mammalian cell.

14. A method according to claim 7, wherein the cell is selected from the group consisting of bacterial cells, yeast cells, fungal cells, plant cells and animal cells.

15. A method according to claim 7, wherein the cell endogenously expresses a GPCR.

16. A method according to claim 7, wherein the cell has been transformed to express a GPCR not endogenously expressed by such a cell.

17. A method according to claim 7, where the test compound is in aqueous solution.

18. A method according to claim 7, where the cells are deposited on a substrate prior to said detecting step.

19. A method of screening a sample solution for the presence of an agonist to a G protein coupled receptor (GPCR), comprising:

a) providing a cell expressing a GPCR and containing a conjugate, the conjugate comprising a .beta.-arrestin protein and an optically detectable molecule;

b) exposing the cell to a sample solution; and then

c) detecting translocation of the detectable molecule from the cytosol of the cell to the membrane edge of the cell;

wherein movement of the detectable molecule from the cytosol to the membrane edge of the cell after exposure of the cell to the sample solution indicates the sample solution contains an agonist for a GPCR expressed in the cell.

20. A method according to claim 19, wherein the cell expresses a GPCR whose function is known.

21. A method according to claim 19, wherein the cell expresses a GPCR whose function is unknown.

22. A method according to claim 19 wherein the cell expresses an odorant GPCR.

23. A method according to claim 19 wherein the cell expresses a .beta.-adrenergic GPCR.

24. A method according to claim 19 wherein the

detectable molecule is Green Fluorescent Protein.

25. A method according to claim 19 wherein the cell is a mammalian cell.

26. A method according to claim 19, wherein the cell is selected from the group consisting of bacterial cells, yeast cells, fungal cells, plant cells and animal cells.

27. A method of screening a test compound for G protein coupled receptor (GPCR) antagonist activity, comprising:

a) providing a cell expressing a GPCR, and containing a conjugate, the conjugate comprising a .beta.-arrestin protein and an optically detectable molecule;

b) exposing the cell to a test compound;

c) exposing the cell to an agonist for said GPCR; and

d) detecting translocation of the detectable molecule from the cytosol to the membrane edge of the cell;

where exposure to the agonist occurs at the same time as, or subsequent to, exposure to the test compound, and wherein movement of the detectable molecule from the cytosol to the membrane edge of the cell after exposure of the cell to the test compound indicates that the test compound is not an antagonist for said GPCR.

28. A method according to claim 27 wherein the cell expresses a GPCR whose function is unknown.

29. A method according to claim 27 wherein the cell expresses an odorant GPCR.

30. A method according to claim 27 wherein the cell expresses a .beta.-adrenergic GPCR.

31. A method according to claim 27 wherein the detectable molecule is Green Fluorescent Protein.

32. A method according to claim 27 wherein the cell is a mammalian cell.

33. A method according to claim 27, wherein the cell is selected from the group consisting of bacterial cells, yeast cells, fungal cells, plant cells and animal cells.

34. A method according to claim 27, where the cells are deposited on a substrate prior to said detecting step.

35. A method for screening a test compound for G protein coupled receptor (GPCR) antagonist activity; comprising:

a) providing a cell expressing a GPCR and containing a conjugate, the conjugate comprising a .beta.-arrestin protein and an optically detectable molecule;

b) exposing the cell to a GPCR agonist so that translocation of the detectable molecule from the cytosol of the cell to the membrane edge of the cell occurs;

c) exposing the cell to a test compound; and

d) detecting translocation of the detectable molecule from the membrane edge of the cell to the cytosol of the cell;

where exposure to the agonist occurs prior to exposure to the test compound, and wherein movement of the detectable molecule from the membrane edge of the cell to the cytosol after exposure of the cell to the test compound indicates that the test compound has a GPCR antagonist activity.

36. A method according to claim 35 wherein the detectable molecule is Green Fluorescent Protein.

37. A method according to claim 35 wherein the cell is a mammalian cell.

38. A method according to claim 35, wherein the cell is selected from the group consisting of bacterial cells, yeast cells, fungal cells, plant cells and animal cells.

39. A method according to claim 35, where the test

compound is in aqueous solution.

40. A method according to claim 35, where the cells are deposited on a substrate prior to said detecting step.

41. A method of screening a cell for the presence of a G protein coupled receptor (GPCR) responsive to a GPCR agonist, comprising:

a) providing a cell, said cell containing a conjugate comprising a .beta.-arrestin protein and an optically detectable molecule;

b) exposing the cell to a GPCR agonist; and

c) detecting translocation of the detectable molecule from the cytosol to the membrane edge of the cell;

wherein movement of the detectable molecule from the cytosol to the membrane edge of the cell after exposure of the cell to the GPCR agonist indicates that the cell contain a GPCR responsive to said agonist.

42. A method according to claim 41 wherein the detectable molecule is Green Fluorescent Protein.

43. A method of screening a plurality of cells for those cells which contain a G protein coupled receptor (GPCR) responsive to a GPCR agonist, comprising:

a) providing a plurality of cells, said cells containing a conjugate comprising a .beta.-arrestin protein and an optically detectable molecule;

b) exposing the cells to a GPCR agonist; and

c) detecting those cells in which the detectable molecule is translocated from the cytosol of the cell to the membrane edge of the cell;

wherein movement of the detectable molecule from the cytosol to the membrane edge of a cell after exposure to the GPCR agonist indicates that the cell contains a GPCR for said GPCR agonist.

44. A method according to claim 43 wherein the detectable molecule is Green Fluorescent Protein.
45. A method according to claim 43 wherein the plurality of cells are contained in a tissue.
46. A method according to claim 43 wherein the plurality of cells are contained in an organ.
47. A method according to claim 43 wherein step (b) comprises exposing the cells to a plurality of GPCR agonists.
48. A substrate having deposited thereon a plurality of cells, said cells expressing at least one GPCR and containing a conjugate, the conjugate comprising a .beta.-arrestin protein and a detectable molecule selected from the group consisting of optically detectable molecules and immunologically detectable molecules.
49. A substrate according to claim 48, wherein the detectable molecule is Green Fluorescent Protein.
50. A substrate according to claim 48 wherein the cells are mammalian cells.
51. A substrate according to claim 48, wherein said plurality cells are selected from the group consisting of bacterial cells, yeast cells, fungal cells, plant cells and animal cells.
52. A substrate according to claim 48 wherein the cells express an odorant GPCR.
53. A substrate according to claim 48 wherein the cells express a .beta.-adrenergic GPCR.
54. A substrate according to claim 48, wherein the substrate is made of a material selected from glass, plastic, ceramic, semiconductor, silica, fiber optic, diamond, biocompatible monomer, and biocompatible polymer materials.

55. A method of detecting G protein coupled receptor (GPCR) pathway activity in a cell expressing at least one GPCR and containing .beta.-arrestin protein conjugated to an optically detectable molecule, said method comprising detecting translocation of the detectable molecule from the cytosol of the cell to the membrane edge of the cell, wherein said translocation of the detectable molecule indicates activation of the GPCR pathway.

56. A method according to claim 55 wherein said detectable molecule is Green Fluorescent Protein.

57. A method according to claim 55 wherein said cell is a mammalian cell.

58. A method according to claim 55, wherein the cell is selected from the group consisting of bacterial cells, yeast cells, fungal cells, plant cells and animal cells.

59. A method according to claim 55 wherein the cell expresses a GPCR whose function is known.

60. A method according to claim 55 wherein the cell expresses a GPCR whose function is unknown.

61. A method according to claim 55 wherein the cell expresses an odorant GPCR.

62. A method according to claim 55, wherein the cell expresses a .beta.-adrenergic GPCR.

63. A method according to claim 55, wherein the cell endogenously expresses a GPCR.

64. A method according to claim 55, wherein the cell has been transformed to express a GPCR not endogenously expressed by such a cell.

65. A method according to claim 55, where the cells are deposited on a substrate prior to detecting translocation of the detectable molecule from the cytosol to the membrane edge.

66. A method according to claim 55 wherein said cell is contained in a tissue.

67. A method according to claim 55 wherein said cell is contained in an organ.

68. A method according to claim 1 wherein the cell expresses a taste GPCR.

69. A method according to claim 7 wherein the cell expresses a taste GPCR.

70. A method according to claim 17 wherein the cell expresses a taste GPCR.

71. A method according to claim 27 wherein the cell expresses a taste GPCR.

72. A method according to claim 35 wherein the cell expresses a taste GPCR.

73. A method according to claim 41 wherein the cell expresses a taste GPCR.

74. A method according to claim 55 wherein the cell expresses a taste GPCR.

75. A method according to claim 1 wherein the cell is an insect cell.

76. A method according to claim 7 wherein the cell is an insect cell.

77. A method according to claim 14 wherein the cell is an insect cell.

78. A method according to claim 27 wherein the cell is an insect cell.

79. A method according to claim 35 wherein the cell is an insect cell.

80. A method according to claim 41 wherein the cell is

an insect cell.

81. A method according to claim 55 wherein the cell is an insect cell.

82. A method according to claim 43 wherein said plurality of cells are insect cells.

83. A substrate according to claim 48 wherein said plurality of cells are insect cells.

84. A substrate according to claim 48 wherein the cells express a taste GPCR.

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